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THE
CACTUS
FILE
HANDBOOK

Thelocactus

by John Pilbeam

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The Cactus File Handbook 1

Thelocactus

by John Pilbeam

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Cover picture: *Thelocactus bicolor* var. *wagnerianus*. Photograph by Bill Weightman

PREFACE

Thelocactus has for a very long time held a fascination for me as a cactus enthusiast, and more than once I have written articles about some of the beautiful species in the genus.

In the last few years I have been fortunate to see many of them in their natural surroundings in Mexico, and they have impressed me even more, as they are truly magnificent plants in the wild.

I was therefore delighted when Roger Labbett, the man responsible for the launching of that very successful magazine *The Cactus File*, suggested when I found that an article I was writing on this genus was getting longer and longer, that I write even more text in order to produce a short 'collector's guide' on *Thelocactus*; short that is compared with what I have hitherto produced on some of the larger genera.

Rummaging in the writings of the past about these plants over the last century or more it is rewarding to come across a phrase used about 100 years ago "schöne und beliebte pflanze" (a beautiful and popular plant), which brings home how long these truly wonderful, highly adapted plants we enthuse about have been regarded in awe and delight.

If what I have produced pushes you even one degree nearer a better appreciation of this genus of beautiful plants, and encourages you to grow at least one or two more, then I will have achieved all I could hope for.

John Pilbeam

ACKNOWLEDGEMENTS

Firstly I must of course thank Bill Weightman for his usual painstaking work with his camera, which relieves the weight of the print content of this book, and makes it a much more valuable collector's guide than it might otherwise be.

Secondly I must thank my other companion on the numerous trips to Mexico that we have made in the last decade or so, Derek Bowdery, some of whose shots in the wild are included.

Thanks too to the other enthusiasts who sent photographs — Robin Alabaster, Graham Charles, John Ede, Charles Glass, David Minnion, David Neville, Dan Parker, Rod & Ken Preston-Mafham, Jan Riha, David Rushforth, Nigel Taylor, Cliff Thompson and Bill Tree. Thanks also to Charlotte Walton for once again steering me through the difficulties of understanding the many German references I had to take account of, and Paul Klaassen for helping with Dutch translation.

And most importantly, on the one hand Charles Glass and Bob Foster, and on the other Ted Anderson, whose reviews of this genus about twenty and ten years ago respectively, provided nearly all the information I needed to contemplate such a task.

A useful and informative series of articles by Wim Alsemgeest, Rob Bregman and Rikus van Veldhuisen has appeared recently in *Succulenta* the journal of the Dutch and Belgian Society. These are the result of deliberations over the last 15 years by the 'Thelocactus Studiegroep' in that society. I am grateful to them too for the loan of some slides.

CLASSIFICATION

The main consideration as regards classification is which species to recognize in this genus and which not.

The genus was set up by Britton and Rose in 1922 in the *Bulletin of the Torrey Botanical Club*, volume 49, page 251, and was expanded in their classic work *The Cactaceae* published, as far as this genus is concerned in 1923, when the fourth volume appeared.

Britton and Rose placed *Thelocactus* in their Tribe Cereae, subtribe Coryphanthanae. The members of this subtribe according to them were: 1. *Ancistrocactus*, 2. *Thelocactus*, 3. *Neolloydia*, 4. *Mamillopsis*, 5. *Cochemiea*, 6. *Coryphantha*, 7. *Neobesseya*, 8. *Escobaria*, 9. *Bartschella*, 10. *Pelecypora*, 11. *Phellosperma*, 12. *Dolichothele*, 13. *Solisia* and 14. *Neomammillaria*. Modern thinking among botanists places 4, 5, 9, 11, 12, 13 & 14 beneath the now accepted name for the genus *Mammillaria*. Of the others only *Thelocactus*, *Neolloydia*, *Coryphantha* and *Pelecypora* have withstood the latest onslaught of the "lumping" tendency of current cactus taxonomic thinking.

Britton and Rose's definition of this subtribe is worth repeating, and it is as follows:

"Terrestrial, spiny, low cacti, mostly globose, sometimes cylindric, rarely elongate, 1-jointed, solitary or cespitose, tuberculate, the tubercles numerous; tubercles usually arranged in spirals; juice watery or milky; flowers always solitary at areoles, either at top or side of plant, but never at spine-areoles, large or small, regular (except in the genus *Cochemiea*); ovary naked or bearing a few scales; fruit a green or red indehiscent berry (except in the genus *Bartschella*); seeds small, brown or black."

Extracting the genus *Thelocactus* from their key to these fourteen genera gave: "Ovary more or less scaly, flower campanulate with short tube, none of spines hooked, tubercles not deeply grooved, fruit scaly."

Their more detailed definition of the genus is as follows:

"Cacti of medium size, globular or somewhat depressed, spiny, often densely so; ribs few, low or even indefinite, divided into large, often spiraled, tubercles; flowering tubercles more or less grooved above; flowers from near center of plant, borne on very young tubercles, rather large for the subtribe, campanulate, diurnal; scales on ovary usually few, their axils naked; fruit so far as known dry, dehiscing by a basal pore; seeds black, finely tuberculate, with a large basal hilum."

The generic name, as they explained is from the Greek, *thelo* meaning nipple, referring to the prominent tubercles, which are a more prominent feature than the often indistinct rib structure of these plants.

The twelve species Britton and Rose placed beneath this genus were:

1. *T. hexaedrophorus* (Lemaire, 1839) — chosen as the type species
2. *T. rinconensis* (Poselger, 1855)
3. *T. lophothele* (Salm-Dyck, 1850)
4. *T. phymatothele* (Poselger, 1885)
5. *T. buekii* (Klein, 1859)
6. *T. leucacanthus* (Zuccarini, 1837)
7. *T. nidulans* (Quehl, 1911)
8. *T. fossulatus* (Scheidweiler, 1841)
9. *T. tulensis* (Poselger, 1853)
10. *T. lloydii* (Britton & Rose, 1923)
11. *T. bicolor* (Galeottii, 1848)
12. *T. pottsii* (Salm-Dyck, 1850).

Only five of these (1, 2, 6, 9 and 11) survive at species level in Anderson's 1987 revision of the genus, see below.

Backeberg in his major work, *Die Cactaceae*, volume 5 & 6, recognized seventeen species, and a further eight varieties, as follows:

1. *T. hexaedrophorus* and var. *fossulatus*
2. *T. heterochromus* (Weber, 1896, referred by Britton and Rose to synonymy with *T. pottsii*)
3. *T. rinconensis*
4. *T. lophothele*
5. *T. phymatothelos*
6. *T. bueckii*
7. *T. tulensis*
8. *T. nidulans*
9. *T. krainzianus* (Oehme, 1940)
10. *T. lloydii*
11. *T. bicolor*, var. *pottsii*, var. *bolansis* (Rünge in Schumann, 1898), var. *tricolor* (Schumann, 1898), and var. *texensis* (Backeberg, 1962)
12. *T. wagnerianus* (Berger, 1929)
13. *T. hastifer* (Werdermann & Bödeker, 1931)
14. *T. flavidispinus* (Backeberg, 1951)
15. *T. schwarzii* (Backeberg, 1950)
16. *T. leucacanthus*, var. *schmollii* (Werdermann, 1939), var. *sanchezmejoradai* (Meyran, 1958), and var. *porrectus* (Lemaire, 1838, referred by Britton and Rose to synonymy with *T. leucacanthus*)
17. *T. ehrenbergii* (Pfeiffer, 1838, referred by Britton and Rose to synonymy with *T. leucacanthus*).

Glass & Foster in 1977 in the *Cactus & Succulent Journal (US)*, reviewed the genus as it occurs in the Chihuahuan desert, excluding from their detailed consideration the outlying species *T. hastifer*, *T. leucacanthus* and *T. schwarzii*, as they were strictly outside that desert. They recognized, apart from these three, seven species with a further seven varieties. They were:

1. *T. hexaedrophorus*
2. *T. bueckii*
3. *T. conothele*, var. *aurantiacus* (Glass & Foster, 1972), var. *argenteus* (Glass & Foster, 1972), and var. *mcdowellii* (Rebut ex Quehl, 1894, regarded by both Britton and Rose, and Backeberg as an *Echinomastus* species)
4. *T. rinconensis*, var. *nidulans* and var. *phymatothele*
5. *T. heterochromus*
6. *T. tulensis*
7. *T. bicolor*, var. *flavidispinus* and var. *bolansis*

In 1978 E. F. Anderson and M. E. Ralston published a study of the genus *Thelocactus* in the *Cactus & Succulent Journal (US)*, in which they made a strong case for the inclusion of the genus *Gymnocactus*. But this was later overturned and the species of *Gymnocactus* were referred by Anderson to the genus *Neolloydia* (*Bradleya* 4:1-28, A revision of the genus *Neolloydia*).

Anderson then turned his attention once again to the genus *Thelocactus* and in 1987 produced a thorough review of the genus (*Bradleya* 5: 49-76, A revision of the genus *Thelocactus*), with all the modern technological aids, particularly the use of a scanning electron microscope to assist him in

his thoroughness, by revealing the shape and structure of such almost invisible parts of the plants as the pollen grains, the seed testa and the epidermis. This led him to various conclusions on the taxonomy of the genus, the most startling perhaps to the amateur being the inclusion of the species *T. setispinus*, more commonly known as *Hamatocactus setispinus*. Its companion species in the latter genus had been referred by Nigel Taylor to *Ferocactus* (along with *Thelocactus bicolor*, *T. leucacanthus* and *T. heterochromus*, by the way), which had left *Hamatocactus setispinus* rather out on a limb.

It must be said that while Anderson makes a good case for the inclusion of *Hamatocactus setispinus* in the genus *Thelocactus*, there seem to be as many differences as there are similarities, in particular the hooked spines, yellow flowers with red throat, and red fruit, not dehiscent at the base (or at all) as all other *Thelocactus* species do.

Anderson finished up with eleven species and seven further varieties, as follows:

1. *T. setispinus*
2. *T. bicolor*, var. *flavidispinus* and var. *schwarzii*
3. *T. leucacanthus*
4. *T. macdowellii*
5. *T. tulensis*, var. *buekii* and var. *matudae*
6. *T. hastifer*
7. *T. conothelos*, var. *argenteus* and var. *aurantiacus*
8. *T. lausseri*
9. *T. heterochromus*
10. *T. hexaedrophorus* and var. *lloydii*
11. *T. rinconensis*

The necessity we feel sometimes to categorize in neat compartments parts of nature which are still in a developing state, and which sometimes do not accord with our concepts of their development, gives us more trouble than perhaps we need. Taxonomy seems to me to be the equivalent of trying to do a difficult jigsaw puzzle, in twilight, with a good number of the pieces missing. We should perhaps therefore have more sympathy with taxonomists, but their so often seen lack of agreement among themselves makes sympathy difficult.

In spite of this, Anderson's is really the most thorough work on this genus, and, fortunately more or less coincides with most collectors' concept of *Thelocactus* in the round. It is therefore largely adhered to in this book.

Anderson's redefinition of the genus *Thelocactus* is as follows:

Stem single or clustering, depressed-globose, globose, elongate, cylindrical, to columnar, 2 to 20cm diameter, 3 to 25cm high. *Ribs* distinct or indistinct, 7 to 20, vertical or spiralling.

Tubercles present and very evident in all but one species, rounded to conical. *Areoles* round to elongate, sometimes with a partially developed groove, bearing white to yellowish trichomes, borne on the apices of the tubercles, with or without extrafloral nectaries. *Spines* highly variable, 0 to 30, tending to be persistent. *Central spines* usually present, 1 to 5, 5 to 60mm long, mostly erect, straight or in one species hooked. *Radial spines* 0 to 25, 3 to 35 (to 60)mm long, usually radiating, straight, mostly subulate. *Flowers* arising from the apices of young tubercles, variable in colour, 2 to 8cm diameter. *Ovary* in anthesis covered with scales. *Fruits* green to bright red and mostly dry at maturity, dehiscent by a basal pore except in one species, with scales, round to somewhat elongate, with a persistent perianth. *Seeds* black, pyriform, verrucose (warty) or tessellate (with polygonal ridges), with a large basal hilum, 1 to 2.3mm long, 0.5 to 1.7mm diameter.

Anderson's key is reproduced overleaf, for those who like to try to use such devices to identify plants they have acquired.

KEY TO THE SPECIES OF THELOCACTUS

1. Central spines not hooked; tubercles present; fruits not red and fleshy at maturity, dehiscing by a basal pore2
Central spines hooked; tubercles absent; fruits red and fleshy at maturity, not dehiscing by a basal pore1. *T. setispinus*
2. Flowers mainly of one colour, not with a dark throat3
Flowers mainly of two or three colours, with a dark throat2. *T. bicolor*
3. Stem usually clustering4
Stem usually single6
4. Extrafloral nectaries present; flowers yellow, violet or carmine-red3. *T. leucacanthus*
Extrafloral nectaries absent; flowers magenta or white5
5. Flowers magenta; ribs indistinct; radial spines 15-25, white4. *T. macdowellii*
Flowers white or nearly so; ribs distinct; radial spines 5-12, brownish-red becoming grey5. *T. tulensis*
6. Plants becoming distinctly columnar6. *T. hastifer*
Plants not becoming distinctly columnar7
7. Radial spines 10-258
Radial spines less than 1010
8. Flowers white with dark mid-veins or variable in colour; spines not densely covering the plant, not distinctly white when young; central spines usually more than 25mm long9
Flowers always magenta; spines densely covering the plant, distinctly white when young; central spines usually less than 25mm long4. *T. macdowellii*
9. Radial spines 10-23, 5-20mm long; central spines 1-4, 10-55mm long, 1-2mm diameter; perianth segments variable in colour (Nuevo León, Tamaulipas and San Luis Potosí)7. *T. conothelos*
Radial spines 20-22(-25), 18-20(-28)mm long; central spines 4, 60mm long, 2.5mm diameter; perianth-segments white with dark midveins (Coahuila)8. *T. lausseri*
10. Flowers large, more than 5.5cm diameter11
Flowers small, less than 5.5cm diameter12
11. Tubercles rounded; ribs distinct; central spines 1(-3)9. *T. heterochromus*
Tubercles conical; ribs indistinct; central spines 3-75. *T. tulensis*
12. Tubercles rounded, 13-26mm broad; stems green to olive-green (Nuevo León, Tamaulipas, San Luis Potosí and Zacatecas*)10. *T. hexaedrophorus*
Tubercles conical or at least more or less pointed, 7-15mm broad; stems blue-green, yellowish-green, to purplish-green (absent from San Luis Potosí and Zacatecas)11. *T. rinconensis*

* now also reported from Coahuila and Durango

CULTIVATION

I have found no real difficulty in growing any *Thelocactus* species in England. Some, however, are much slower growing than others, and patience has to be the watchword.

Perhaps the slowest is *T. hastifer*. It has taken me over 30 years to grow a plant from seed to about 50cm long, with two offsets, each about a third that length. I use the word long rather than tall, as this is a plant I have found will not support itself after it gets to about 15cm or so tall. It is very narrow at the base as a seedling, and elongates to form a narrow stem which after a few years becomes decumbent, looping down, the tip straining to face the sun. But some of the more globular species are equally slow in their own way. I have a plant of *T. rinconensis* var. *phymatothelos* of the same age as my *T. hastifer*, and it is a squat, flattened-globose shape, and no more than 13cm in diameter.

One of the most rapid growing species is *T. bicolor*, which will often make a fair-sized clump to fill a 20cm pan in about 10 years or so. Having said that I have found *T. bicolor* var. *flavidispinus* grows at a very slow rate, and *T. bicolor* var. *bolaensis* is somewhere in between the two.

Other fast growing species are *T. leucacanthus* and *T. setispinus*, but most others are comparable with the tortoise rather than its large-eared companion.

Soil

Nearly all species are reported from limestone soils in the wild, but they seem remarkably tolerant of different potting mixtures in cultivation. A more important consideration is good drainage, since most occur on sloping ground, where they do not stand in water for any time to speak of. I have for some time now incorporated quite coarse granite grit in my potting mixes, and for *Thelocactus* species the proportion is about 60% soil-based compost to 40% grit.

Watering

I have found that plants from the Chihuahuan desert do not appreciate watering too early in the year, and whereas I tend to start watering more westerly Mexican cacti in early March, I leave it until the end of March or mid April before I start waking up my *Thelocactus* species. By this time the sun in England, hopefully, has a little more warmth in it than in March, and the slumbering, thick-skinned *Thelocactus* are ready to stir. Nor do I extend the watering much into October; since most plants are in at least 10cm pots, they need time to dry out before the dull, cloud-strewn days of November arrive to slow down the drying out process.

During the growing season a good dousing about once a fortnight if it is sunny, is enough; if it is not sunny they will come to no harm at all for being left to dry out for another week or so.

Feeding

Like all cacti, *Thelocactus* appreciate feeding with high potash fertilizers during the growing season, and I feed about once a month, full strength, with the sort of fertilizers that you would use on tomatoes, roses or chrysanthemums. It is a good idea to vary the brands, to make available any of the trace elements included in some but not others.

It is also a good idea I think to give your liquid feeding *lightly* a day or two after watering normally, so that the roots are active and can immediately take full advantage of the liquid feed; to pour it on when the soil is dry is to waste it wetting the soil and promoting the growth of the hair roots which do the work a day or so later.

Light

Above all else I think *Thelocactus* need bright, sunny conditions to give of their best. I have never found it necessary, even in the sunniest of our summers in England, to shade the glasshouse, and when I have noticed a lack of flowers on some species, it is usually because they have been placed in a less advantageous position as regards their share of the available sun.

Temperature

These plants will take down to nearly freezing in the winter if they are completely dry at the root, and have been dry for a while, so that the sap content has become less liquid. The danger times if you have no heat in the glasshouse are those early frosts in the autumn when the plants are still quite sappy, and the late frosts in the spring after you have started watering and the plants have taken up water and swelled up; this is even more reason, if you have no heat, to delay watering until April.

Give good ventilation in the summer to keep the temperature down in very sunny weather. At all times air movement is important, and I know of several growers who provide no heat for their plants at all, but keep a fan running all year round to achieve this.

Potting on

Pot on every year for at least the first five years to keep growth moving and develop an even, well-shaped plant. After this every other year will do, but to leave it longer is to slow down the plant's potential. For some years now I have followed the thinking for most garden plants and potted on when the plants are dormant in the winter. If the soil is on the dry side when you do it, and the roots are disturbed as little as possible, you should have no trouble.

Pests

Mealy-bugs are just as fond of *Thelocactus* as any other succulent plant, and a constant vigil is needed to catch this troublesome pest when first it appears. The yearly potting régime will help you keep on top of this and other pests, particularly the root mealy-bug, more of which below. Prevention by way of quarantine for plants newly acquired is the best plan, until you are sure they are pest-free.

Brushing off (away from the glasshouse and other plants) with an old paintbrush the worst of the infestation if it occurs is a good start, but follow this with a spray of insecticide, and repeat a month or so later, and regularly as a routine preventative measure at least two or three times a year. I have to say that what I have seen of natural predators for these pests has not impressed me: if you are prepared to put up with these pests, the predators will keep the numbers down, but they certainly do not rid you of them completely.

Root mealy-bugs are best dealt with by cutting off the finer roots completely, brushing clean the base of the plant and any thick roots, treating the cut root surfaces with a fungicide powder (as contained in hormone rooting powders), drying off thoroughly, dipping for extra safety in a solution of insecticide once the cut surfaces are dry, and when dry, repotting in fresh soil and of course clean pots. Check for appearance of roots at base weekly, and do not water before roots start to re-appear.

Red spider mite is an insidious pest of cacti which have a relatively thin epidermis. I have not known it affect any *Thelocactus*, but it would not surprise me to hear that other growers had suffered from it. Spraying your plants with water about once a week during the growing period (when these pests are at their most active) does discourage them, as they prefer dry, warm conditions, but the only real cure or preventative is an acaricide spray (any pesticide which specifies red spider mite as among those pests it controls) applied three or four times a year, and I do this as a routine for all my plants. As with mealy-bug, there is a predator, but like the mealy-bug predator it will only keep down the

number of pests, not eradicate them completely and permanently. Another disadvantage with these predators is that they will not usually suffer temperatures below about 10°C, so that they have to be repurchased every year.

Sciara or mushroom fly is a problem for all cacti, and *Thelocactus* are no exception. These are tiny, slow-moving, black flies, whose larvae will feed beneath the soil on the roots or inside the bodies of our beloved plants. Seedlings are the most vulnerable to their attacks, but mature plants can also be affected if their numbers are allowed to build up. Yellow sticky fly traps seem to keep the numbers down, and the best stage to attack them is certainly when they are in the flying state, so spraying whenever they are observed is a good idea. An occasional soaking of the soil with an insecticide will take care of the larvae too, but not if they are deep within a host plant! Peat in the potting mix undoubtedly encourages them, and I suspect that bought-in peat composts often bring in the pest with them; putting the peat for three minutes in a microwave on high setting seems to cure the problem, obviously *before* you put the plants in the compost.

Sooty mould

The water spraying routine will also prevent the onset of another problem with the species which have extrafloral nectaries (glands which exude sap): this is the sooty mould which tends to form on the sugary excretion made by these nectaries. Prevention is better than cure, but if the problem does develop incorporate a fungicide with the spraying about once a month, and this should keep it at bay.

Finally I must re-emphasize that prevention is the best method of avoiding an attack from the various problems detailed above. Quarantine all your new acquisitions, and act quickly at the first signs of trouble; once you allow numbers of any of these pests to build up you will never be rid of them.

Thelocactus conothelos var. *argenteus* in habitat on a peak at Cerro Chico, Nuevo Leon, Mexico



GEOGRAPHY

The maps produced here are based on those used in Ted Anderson's review and I am grateful for his permission to use them.

As they show this is a genus widespread in the north and central parts of Mexico, with some species narrowly defined, and others covering hundreds of square miles. It also just spills over the border into Texas.

Anderson reports that it is mostly confined to the Chihuahuan Desert, but here and there strays out of the strict definition of this desert into Tamaulipan Brushland or Thorn Shrub (*T. bicolor* var. *schwarzii*) and the Rio Grande Plains region and southward into the Tamaulipan Brushland (*T. setispinus*). It also gets into savannah and grasslands at its more southern and western extremes (*T. hexaedrophorus*).

The following list of states shows which species occur in them, for more precise details see under the commentary on the individual species:

USA

Texas:

T. bicolor, *T. bicolor* var. *flavidispinus*, *T. setispinus*

Mexico

Chihuahua:

T. bicolor, *T. heterochromus*

Coahuila:

T. bicolor, *T. bicolor* var. *bolaensis*, *T. hexaedrophorus*, *T. lausseri*, *T. macdowellii*, *T. rinconensis* (all varieties), *T. setispinus*

Durango:

T. bicolor, *T. heterochromus*, *T. hexaedrophorus*

Guanajuato:

T. leucacanthus

Hidalgo:

T. leucacanthus

Nuevo León:

T. bicolor, *T. bicolor* var. *commodus*, *T. conothelos* (all varieties), *T. hexaedrophorus* var. *hexaedrophorus*, *T. macdowellii*, *T. rinconensis*, *T. tulensis* (all varieties), *T. setispinus*

Querétaro:

T. hastifer, *T. leucacanthus*

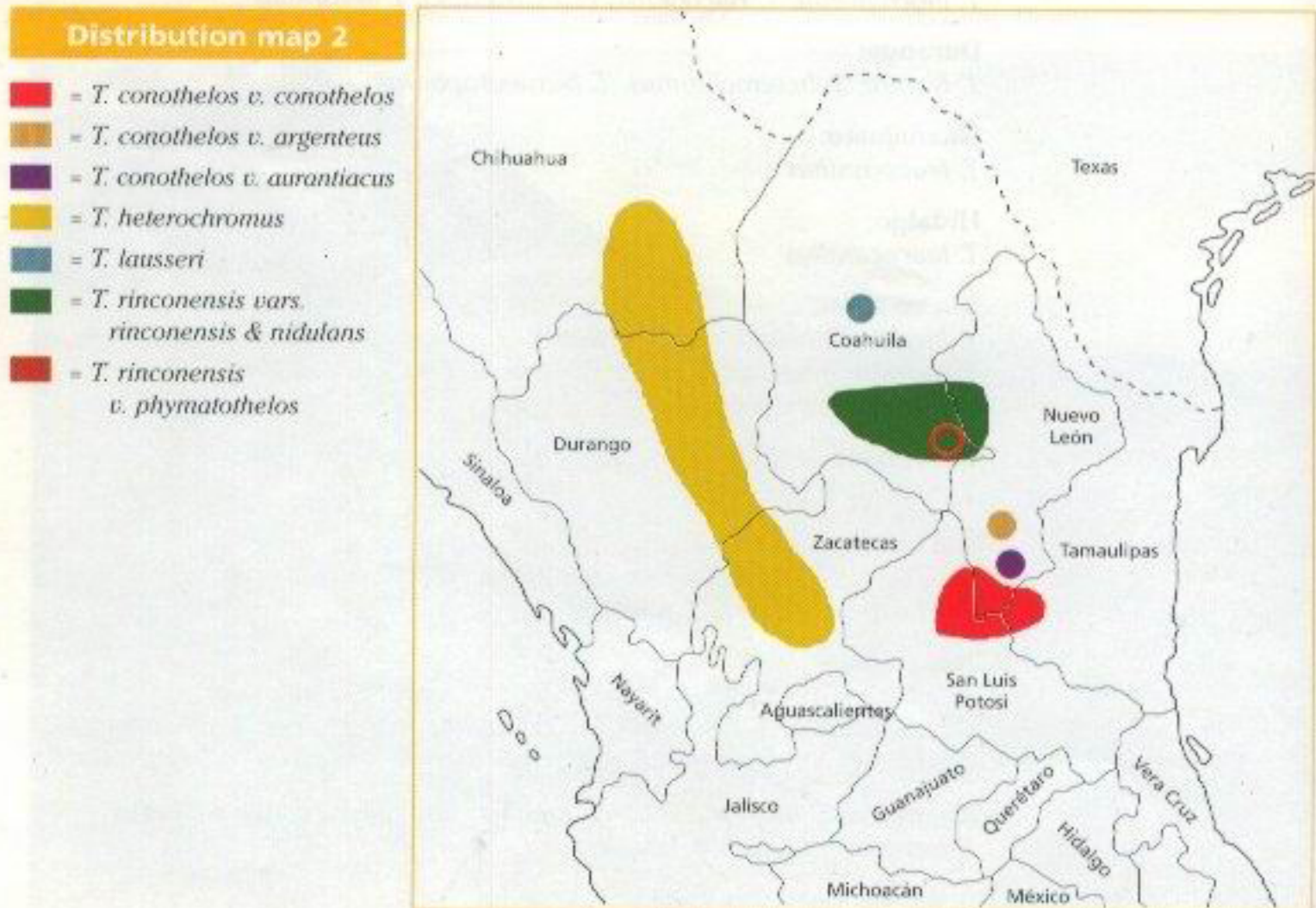
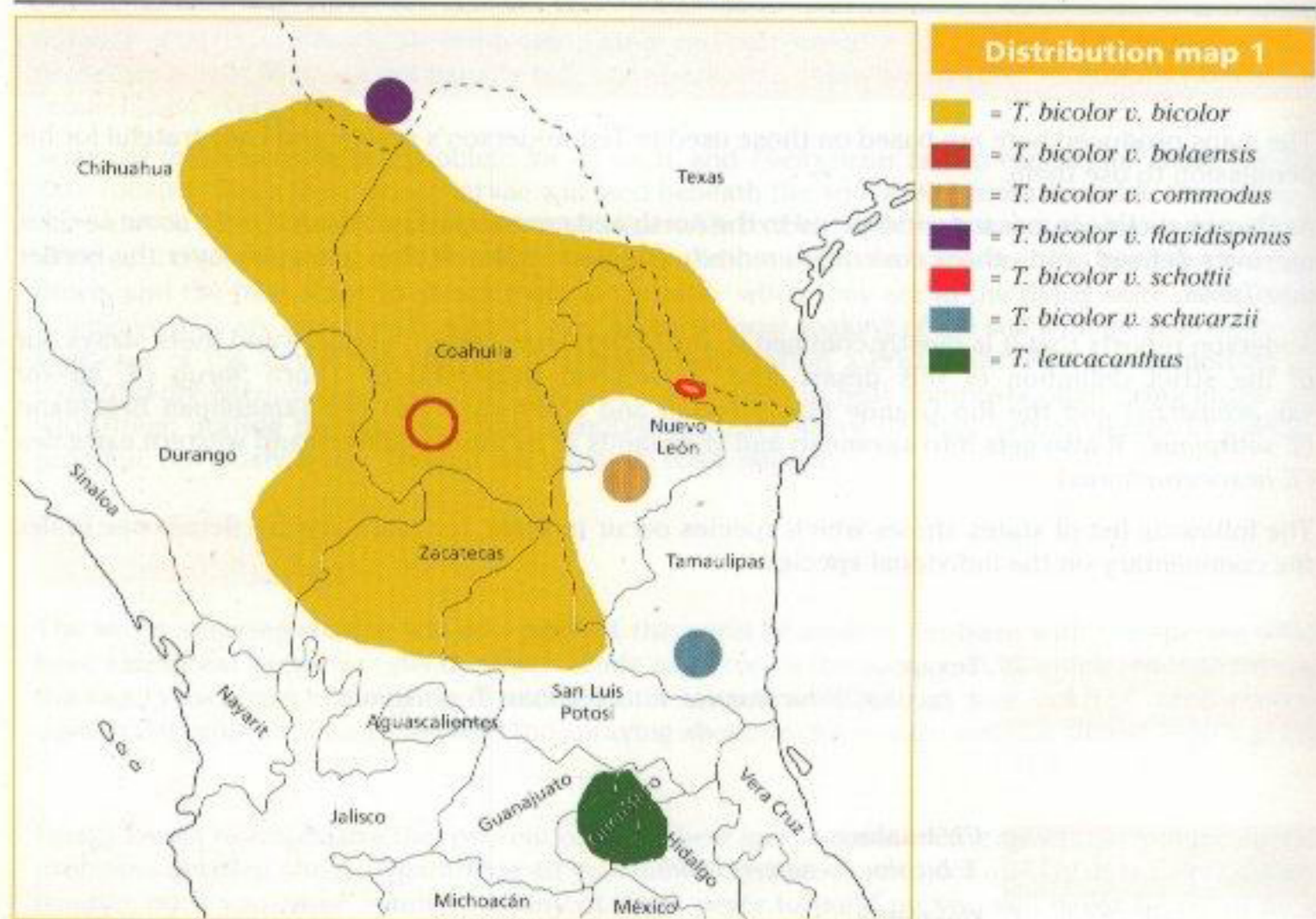
San Luis Potosí:

T. bicolor, *T. conothelos* var. *conothelos*, *T. hexaedrophorus* var. *hexaedrophorus*, *T. tulensis*

Tamaulipas:

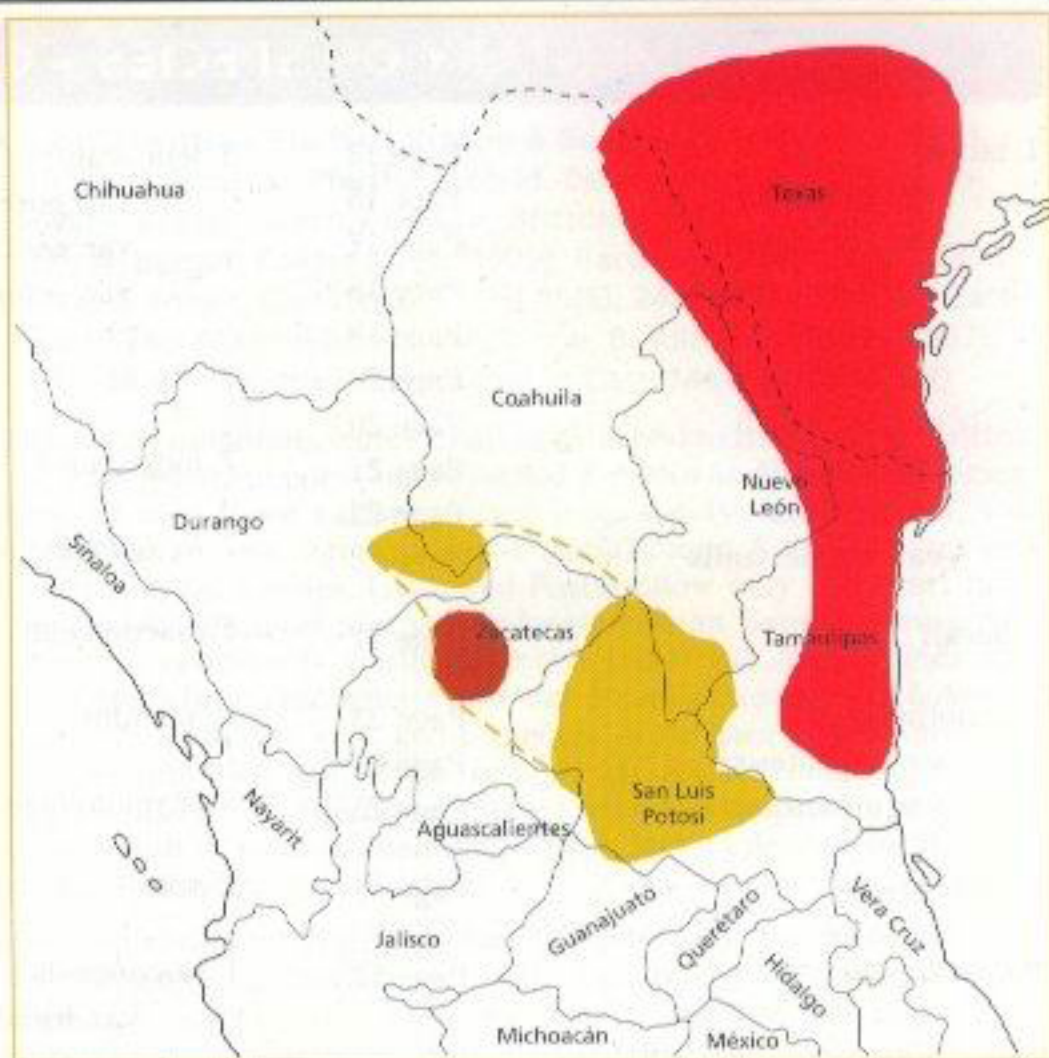
T. bicolor var. *schottii*, *T. bicolor* var. *schwarzii*, *T. conothelos* var. *conothelos*, *T. hexaedrophorus* var. *hexaedrophorus*, *T. setispinus*, *T. tulensis*

Zacatecas: *T. bicolor*, *T. heterochromus* (one questionable report), *T. hexaedrophorus* var. *lloydii*



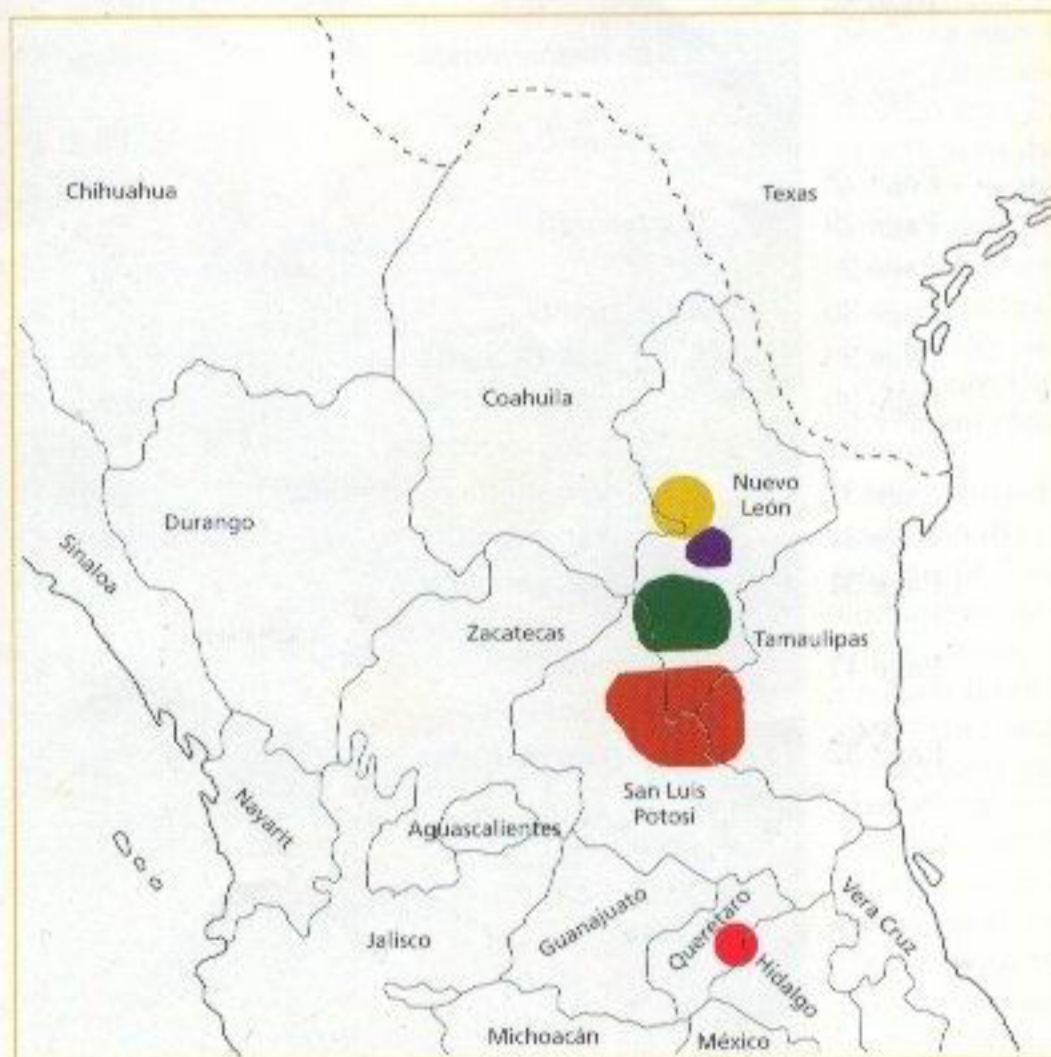
Distribution map 3

- = *T. setispinus*
- = *T. hexaedrophorus*
v. *hexaedrophorus*
(the dotted line indicates
the possible full
distribution of
T. hexaedrophorus)
- = *T. hexaedrophorus*
v. *lloydii*



Distribution map 4

- = *T. macdowellii*
- = *T. tulensis* v. *tulensis*
- = *T. tulensis* v. *buehii*
- = *T. tulensis* v. *matudae*
- = *T. hastifer*



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var. <i>texensis</i>	Page 21	<i>T. longispinus</i>	Page 48
var. <i>tricolor</i>	Page 22		
var. <i>wagnerianus</i>	Page 22	<i>T. lophothele</i>	Page 48
<i>T. buekii</i>	Page 47	<i>T. macdowellii</i>	Page 35
<i>T. conothelos</i>	Page 23	<i>T. nidulans</i>	Page 48
var. <i>argenteus</i>	Page 24		
var. <i>aurantiacus</i>	Page 25	<i>T. phymatothele</i>	Page 48
<i>T. ehrenbergii</i>	Page 47	<i>T. pottsii</i>	Page 48
<i>T. flavidispinus</i>	Page 47	<i>T. rinconensis</i>	Page 37
		var. <i>freudenbergeri</i>	Page 38
<i>T. fossulatus</i>	Page 47	var. <i>nidulans</i>	Page 39
		var. <i>phymatothelos</i>	Page 40
<i>T. hastifer</i>	Page 26		
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var. <i>decipiens</i>	Page 29		
var. <i>droegeanus</i>	Page 29	<i>T. setispinus</i>	Page 41
var. <i>fossulatus</i>	Page 30	var. <i>cachetianus</i>	Page 42
var. <i>labouretianus</i>	Page 30	var. <i>hamatus</i>	Page 42
var. <i>lloydii</i>	Page 30	var. <i>mierensis</i>	Page 42
var. <i>major</i>	Page 31	var. <i>muhlenpfordtii</i>	Page 42
var. <i>paradensis</i>	Page 31	var. <i>orcuttii</i>	Page 42
var. <i>roseus</i>	Page 31	var. <i>setaceus</i>	Page 42
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		<i>T. tulensis</i>	Page 43
<i>T. krainzianus</i>	Page 47	var. <i>buekii</i>	Page 44
		var. <i>matudae</i>	Page 45
<i>T. lausseri</i>	Page 32		

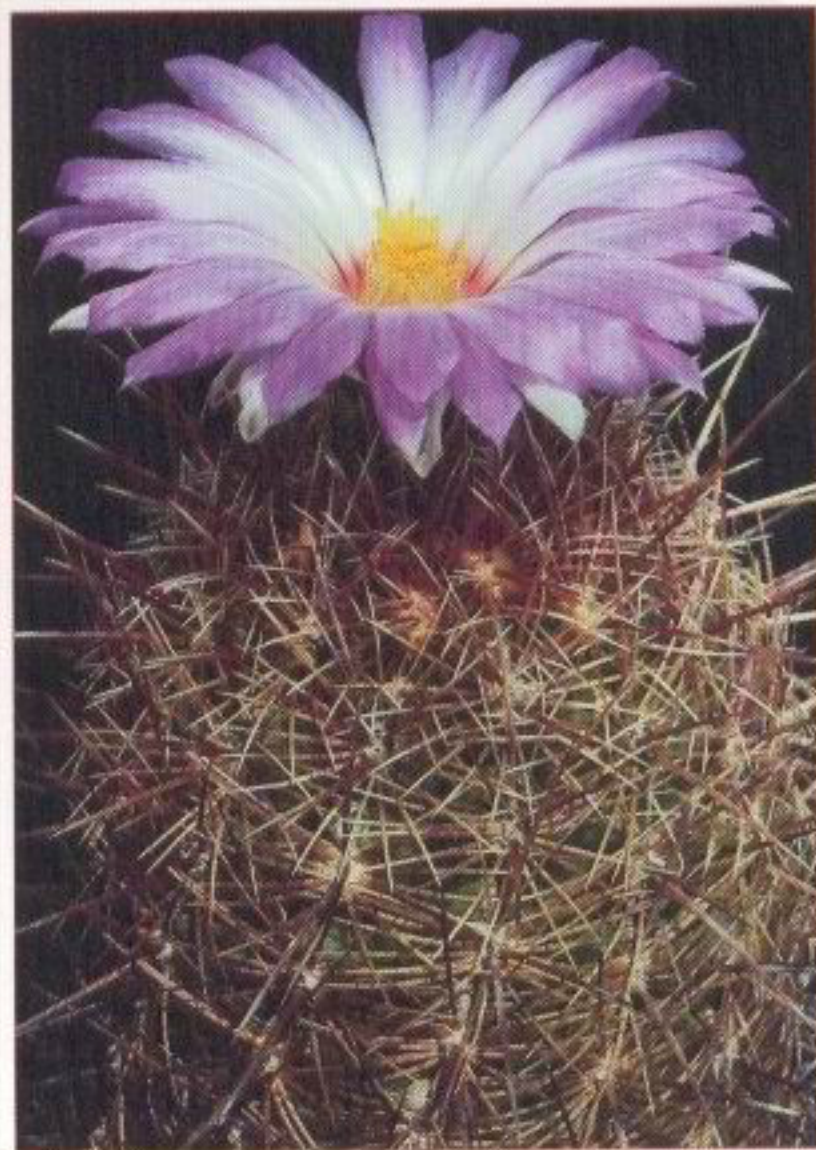


Thelocactus bicolor

T. bicolor (Galeotti ex Pfeiffer) Britton & Rose, Bull. Torrey Bot. Club 49:251(1922); Galeotti ex Pfeiffer, Abbild. Besch. Cact. 2: pl.25 (lecto-type) (1848) – as *Echinocactus bicolor*; Britton & Rose, The Cact. 4:11(1923); A. Berger, Kakteen 256 (1929); Backeberg, Die Cact. 5:2808 (1961); Glass & Foster, Cact. Succ. J. (US) 49(6): 248 (1977); Benson, Cacti US & Canada 780-783 (1982); E. F. Anderson, Bradleya 5: 57, 59 (1987); H. Bravo-Hollis & S. Sánchez-Mejorada, Las Cact. México 178 (1991)

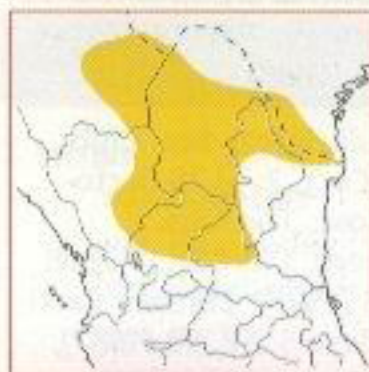
There have been numerous varietal names attached to this species. Britton and Rose acknowledged none, but regarded *T. pottsii* as a separate species. Backeberg allowed three varieties apart from the type, var. *pottsii*, var. *bolansis* and var. *tricolor*, but regarded *T. flavidispinus*, *T. wagnerianus* and *T. schwarzii* as good species. Glass and Foster allow only two apart from the type: var. *flavidispinus* and var. *bolansis*. Lyman Benson allows two (remember his concern is confined to the USA): var. *flavidispinus* and var. *schottii*. Helia Bravo recognizes two: var. *flavidispinus* and var. *bolansis*, but regards *T. schwarzii* as a good species in its own right. Anderson acknowledges only two, var. *schwarzii* and var. *flavidispinus*; the rest he dismisses as either too little differentiated from the variable type and so synonymous with it, or as unidentifiable from lack of precise locality (or any locality at all) or proper illustration.

T. bicolor var. *bicolor*,
in cultivation, grown
from seed off a
habitat plant



It is perhaps worth quoting Anderson's requirement for recognition of varieties (or even species) here: while discussing the variability of *T. rinconensis*, he says in his 1987 review of the genus that "It is impossible to delineate varieties — or species — on the basis of spination, which has provided the primary features used by previous workers because one can find a complete series of spine characters throughout the range of this group [*T. rinconensis*]. It simply is not practical to delimit separate species or even varieties within this group because of the geographic proximities and overlapping of spine characters from one population to another. A taxonomic variety should be geographically isolated from another; this is clearly not the case within this group." This statement clearly applies equally to *T. bicolor*.

I have nevertheless discussed all of these names in the text below, as from a collector's point of view some are worthy of consideration as collectors' plants, and there does seem to have been some disagreement by the reviewers of the genus over the years, as to which should be recognized and which not. There is too a considerable range of flower colour in the species, including odd white flowered plants, but mainly in the proportions of the (usually) red or deep magenta of the flower throat, with the paler colouring of the petal tips, as well as the presence or not of a white band between the two.



var.
bicolor

The type which because of later described varieties we should refer to as *Thelocactus bicolor* var. *bicolor* is described as having a single stem, or clustering, from 5 to 38cm tall, and 5 to 14cm wide, varying from globose to elongated-globose, coloured blue-green, or grey-green, green or yellowish-green, with 8 to 13 ribs, vertical or spiralling. The areoles have extrafloral nectaries, as do all varieties or forms of this species. The central spines (those arising from the centre part of the areole) number 1 to 4, 15 to 33 (exceptionally to 75)mm long, coloured reddish-purple with a yellowish-white tip, or yellowish-white throughout, one more or less erect, flattened and much longer (this is the potential 75mm), the others spreading. Radial spines (those originating from the outer part of the areole) number 8 to 15 (exceptionally to 17 or 18), 10 to 24mm long, the basal third coloured reddish-purple, the upper two thirds yellowish-white, or wholly yellowish-white, spreading outwards. The flowers are large, about 4 to 8cm long and wide, coloured within a light magenta at the upper part of the petals sometimes fading to white, becoming much darker below, filaments white, anthers yellow, style white, stigma lobes 7 to 13, red, yellow or yellow-orange.

As a whole the species is widely distributed in Mexico, and just into the southern USA, from the Big Bend region of Texas, southwards into Mexico, in eastern Chihuahua and Durango, northern Zacatecas and San Luis Potosí, most of Coahuila, straying into Nuevo León, and the extreme north of Tamaulipas and again over the border into south-eastern Texas.

I have been lucky enough to see this species several times in habitat, sometimes in flower, in a wide area around the town of San Luis Potosí in the state of that name, which is just about at its most southerly occurrence. Most plants seen were solitary, but there was an occasional, ancient, clumping plant, with up to 30 or 40 stems.



T. bicolor var. *bicolor*, in habitat, near the town of San Luis Potosí, in the state of San Luis Potosí, Mexico



var.
bolaensis

var. **bolaensis** (Runge) Schumann, A. Berger, Kakteen, 256 (1929) – as *T. bicolor* var. *bolansis*; Runge, Gartenflora 38:106 (1889) – as *Echinocactus bolaensis*; Schumann, Gesamtb. Kakt. 303-4 (1898) – as *Echinocactus bicolor* var. *bolansis*; Backeberg & Knuth, Kaktus-ABC 358 (1935) – as *T. bicolor* var. *bolansis*; Backeberg, Die Cact. 5:2809, fig. 2641 (1961) – as *T. bicolor* var. *bolansis*; Glass & Foster, Cact. Succ. J. (US) 49(6): 251 (1977) – as *T. bicolor* var. *bolansis*; N. P. Taylor, Cact. Succ. J. Gr. Brit. 41: 30 (1979) – as *Ferocactus bicolor* var. *bolaensis*; E. F. Anderson, Bradleya 5: 59 (1987) – as *T. bicolor* var. *bolaensis*; H. Bravo-Hollis & H. Sánchez-Mejorada, Las Cact. México 2: 182 (1991) – as *T. bicolor* var. *bolansis*.

Anderson corrects the spelling to the original 'bolaensis', and points out that no type locality was cited in the original description nor a type specimen designated, but he adds that since there was an excellent illustration this could serve as a lectotype. He goes on to reduce this variety to synonymy with the type, since he says that although localized it is neither geographically nor edaphically (the soil in which it grows) separated from the type. This is a pity from a collectors' point of view, since it has a distinctive habit and spination, forming tall cone-shaped stems, narrower than the type, to about 20cm tall or more and about 8 to 10 cm wide at the base, clustering sparingly, and with very dense light coloured spines, and it seems to be very localized albeit within the overall area of the species.

Plants in cultivation from Cerro Bola, Coahuila have pale straw coloured spines, sometimes red in youth, later turning chalky white; with about 25

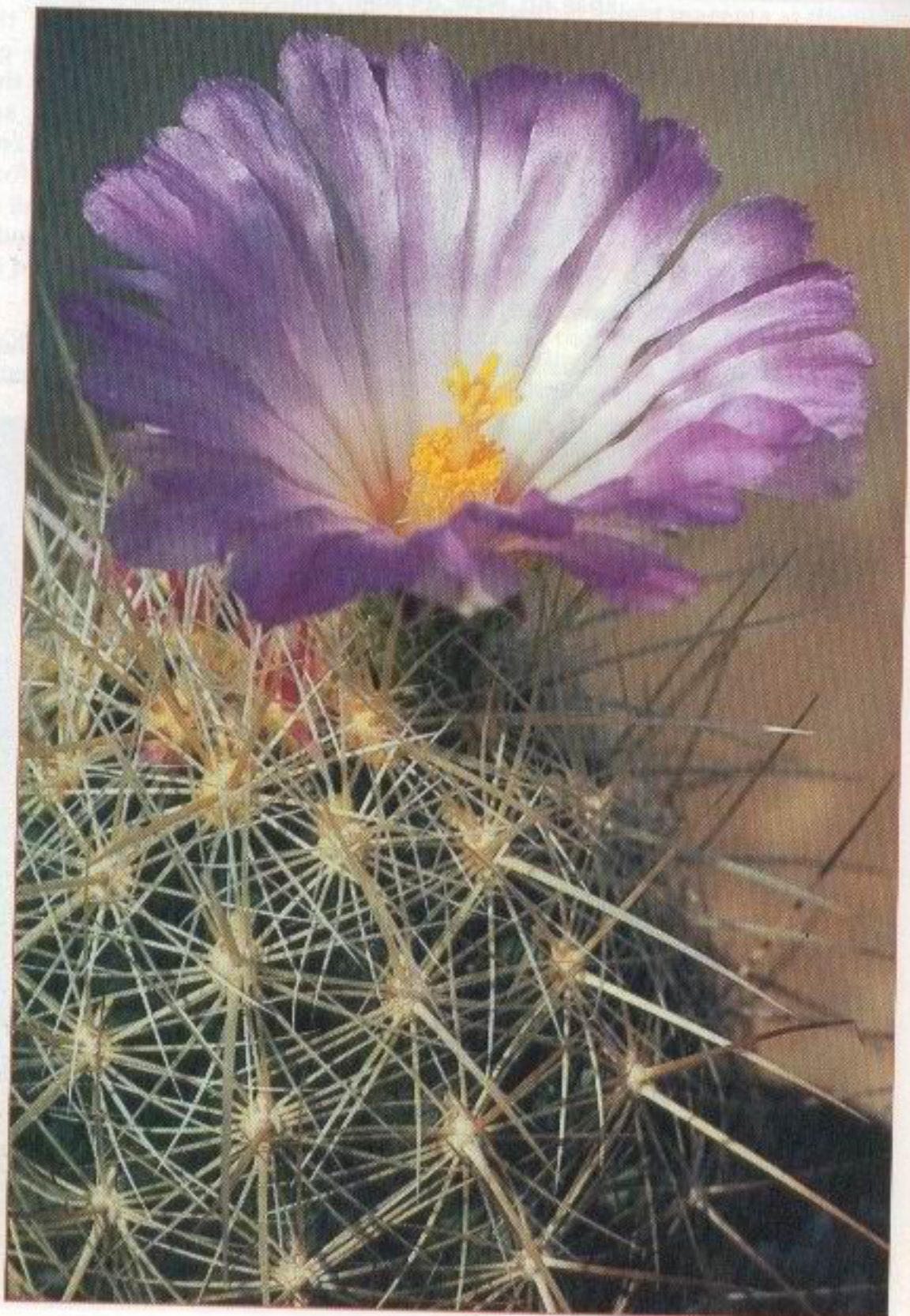


T. bicolor var. *bolaensis*,
in habitat, at the type
locality, Cerro Bola,
Coahuila, Mexico

radial spines, strongly interlacing to cover the body completely from view with a thick basketwork of spination; there are about 3 central spines, one standing out from the plant, the others ascending, longer than the radials. The flowers are distinctive too, 7cm or more long and wide, pale lilac coloured at the tips of the petals, fading to white below, with sometimes a small amount of orange colouring at the base.

Schumann (1898) reported it to come from Sierra Bola, and Glass and Foster pictured plants from Cerro Bola east of San Pedro de las Colonias in southern Coahuila; Bravo reports it also from the Laguna de Viesca.

I am inclined to support the view taken by Glass and Foster and others to retain it, in view of its very individual appearance and its quite restricted occurrence.



T. bicolor
var. *bolaensis*, in
cultivation, ex habitat,
Cerro Bola, Coahuila,
Mexico



var.
commodus

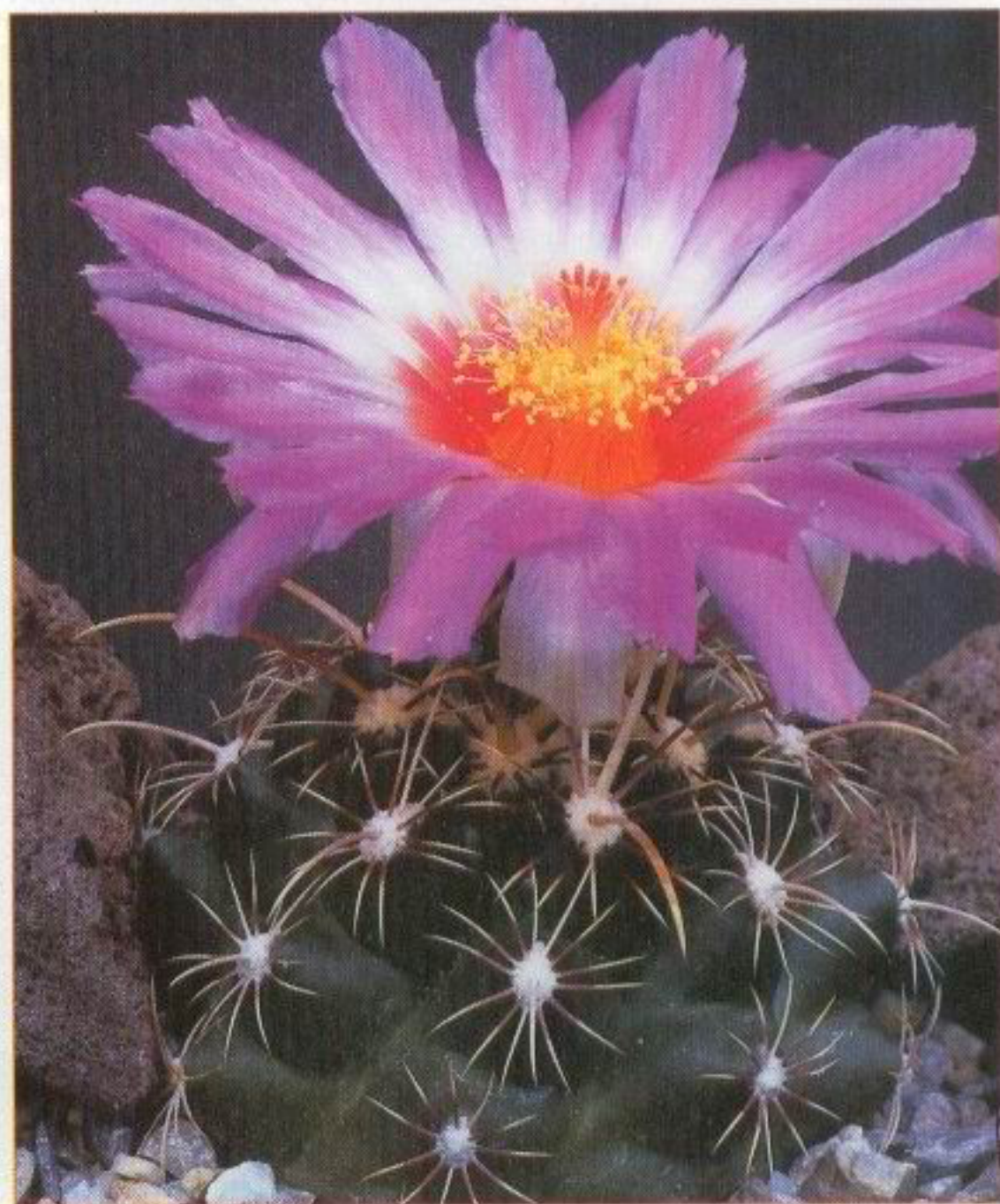
var. **commodus** Haas, Kakt.u.a.Sukk.39(4):86-7 (1988); & 30(12):296 (1979)

This variety comes from Montemorelos, south of Monterrey in the state of Nuevo León, Mexico, outside Anderson's record of the species so far.

As long ago as 1896, Weber in *Bois Dict. Hort.* referred to *Echinocactus bicolor montemorelanus*, but it was never described formally. Robert Haas has now rectified this with a description of a plant from this area under the new name *T. bicolor* var. *commodus*.

He describes it as solitary with flattened-globose to globose stem, to 7cm tall, 8cm wide, with 8 to 11 ribs. Radial spines number 11 to 15, 10 to 20mm long, yellowish-horn coloured, distinctly wine-red in the middle section; there is one stronger central spine, distinctly flattened or somewhat angled, 35mm long, yellowish-horn coloured. Flowers are large, getting to 10cm across, light magenta, and red in the throat, sometimes with a middle band of white.

Seedlings of this attractive variety are now getting into cultivation, and it is certainly quite distinctive in the young stages. Its separate standing may yet be questioned.



T. bicolor
var. *commodus*, in
cultivation, grown from
habitat seed collected
at Montemorelos,
Nuevo León, Mexico



var.
flavidispinus

var. **flavidispinus** Backeberg, Beitr. Sukk.-Kunde Pflege 1941:6 (1941); & Cact. Succ. J. (US) 23: 150 (1951) – as *T. flavidispinus*; Die Cact. 5:2812, fig.2642 (1961) – as *T. flavidispinus*; Glass & Foster, Cact. Succ. J. (US) 49(6): 251 (1977); Benson, Cacti of US & Canada 781-2, pl.150 (1982); E. F. Anderson, Bradleya 5: 62 (1987); H. Bravo-Hollis & H. Sánchez-Mejorada, Las Cact. México 181 (1991)

This variety is less often seen in cultivation than the type in its various forms, and this is an anomaly as when I was lucky enough to see this variety in habitat in the Big Bend area of Texas, it was so thick on the ground that it was difficult to walk in the area without treading on the plants, but it is very restricted in its distribution. The plants were low-growing and small, single heads no more than about 4 to 5cm tall and about 7cm across. In cultivation they are slow, and I have not seen other than small, solitary plants. This variety is noted, as the name implies, for its yellow spination, often with bright red central spines as they emerge, fading to yellow.

The description is of small single stems 1.5 to 4.5cm tall, 2 to 7cm wide, globose to flattish-globose, coloured green, with about 13 poorly defined ribs. There are usually 3 central spines, 15 to 24mm long, red at first, later yellow to yellowish-white, straight and erect. Radial spines number 12 to 17, 10 to 15mm long, yellowish, later yellowish-white, spreading radially, the upper one much longer (38 to 45mm) and flatter than the other spines. Flowers are 4 to 5cm wide, and nearly 4cm long, purple-pink with violet tints, deep red at the throat.

As indicated above it is very restricted in its distribution, and is reported from near the Rio Grande in Texas, in north-eastern Brewster County south and east of Marathon, and from Starr County; Anderson defines the distribution as "on outcrops of Caballos Novaculite from 29°50' to 30°10' N and from 102° to 103°30' W, at 1200 to 1330m".



T. bicolor
var *flavidispinus*, in
habitat, 15 miles south
of Marathon, on west
side of US 385 highway,
in Brewster County,
Texas, USA

var.
pottsii

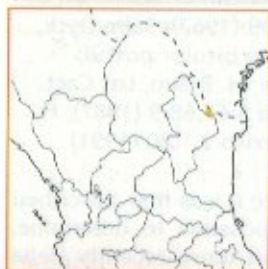
var. **pottsii** (Salm-Dyck) Backeberg, Die Cact. 5:2809 (1962); Salm-Dyck, Cact. Hort. Dyck., 1849.173 (1850) – as *Echinocactus bicolor pottsii*; Britton & Rose, The Cact. 4:12 (1923) – as *T. pottsii*; H. Bravo, Las Cact. de Mexico, pl. 247 (1937); E. F. Anderson, Bradleya 5:61,68-9 (1987); H. Bravo-Hollis & H. Sánchez-Mejorada, Las Cact. México 2: 180 (1991)

The lack of precise locality and length of time since it was first described have made this variety of *T. bicolor* almost impossible to determine, although the name clings on. Both Anderson and more recently Helia Bravo have reduced it to synonymy with the type.

Britton and Rose gave the type locality as near Chihuahua city, and described the variety as globular to somewhat depressed, 10 to 15cm in diameter, somewhat glaucous, yellowish, with 8 or 9 ribs, and 7 to 10 radial spines straight or incurved, more or less banded with red and white or pale yellow, 1 to 3cm long; central spines several, more or less flattened, 3 or 4cm long, often white, but sometimes banded with red; flowers 5 to 6cm long, inner petals light purple, darker at base. Steven Brack lists his collection number SB 77 tentatively as this variety, collected near Jimenez, Chihuahua, and, as the picture of a plant in his collection shows, it does have the striking red and white banded spination described above.

T. bicolor var. *pottsii*
(SB 77), in cultivation,
ex habitat, Jimenez,
Chihuahua, Mexico





var.
schottii

var. **schottii** (Engelm.) Krainz, Die Kakteen, Lfg. 18 (Oct.1961); Engelm., Syn. Cact. US 21 (1856); Backeberg, Die Cact. 5:2809 (1962); Glass & Foster, Cact. Succ. J. (US) 49(6):248 (1977); Benson, Cacti of US and Canada 782, pl.149 (1982); E. F. Anderson, Bradleya 5: 57, 59 (1987); H. Bravo-Hollis & H. Sánchez-Mejorada, Las Cact. México 2: 180 (1991)

This variety was reported from cretaceous (chalky) hills near Mier in 1853 by Schott; Schott also cited it from the Rio Bravo. Mier is in northern Tamaulipas, near the US border, the most eastern reported occurrence for the species.

Krainz described (but did not picture) it as 10 to 15cm tall, 5 to 7.5cm wide, with 4 upper, flat, radial spines 2.5cm long, the others round, red, both paler at the tips, the upper weaker and shorter, often curving. The upper central spine 3 to 4cm long, the lower three shorter. Flowers 5 to 7.5cm long, light to pinkish purple.

Benson also retains it as a variety of *T. bicolor*, reporting it from Texas, near the Rio Grande in the Big Bend region in Brewster County and Starr County as well as from "adjacent Tamaulipas". It must be said that Tamaulipas at its nearest point is about 250 miles from the Big Bend region of Texas, and Mier nearly a further 100 miles. Be that as it may Benson describes and pictures a plant with stems 7.5 to 10 (exceptionally 13)cm long and 5 to 7.5 (exceptionally 12)cm wide; central spines relatively long, the upper longest, to 4.5cm, tinged with pink; radial spines 15 to 17, the upper 1 to 3 spines straw coloured or white and 5 to 10cm long, and about 1.5mm broad, most tinged with pink; the flower pictured is large, deep magenta, deeper coloured in the throat. He adds that "the long red-and-white spines are the obvious feature of the plant, except when the gorgeous large flowers are present".

Glass and Foster, and subsequently Anderson sink it beneath the type.

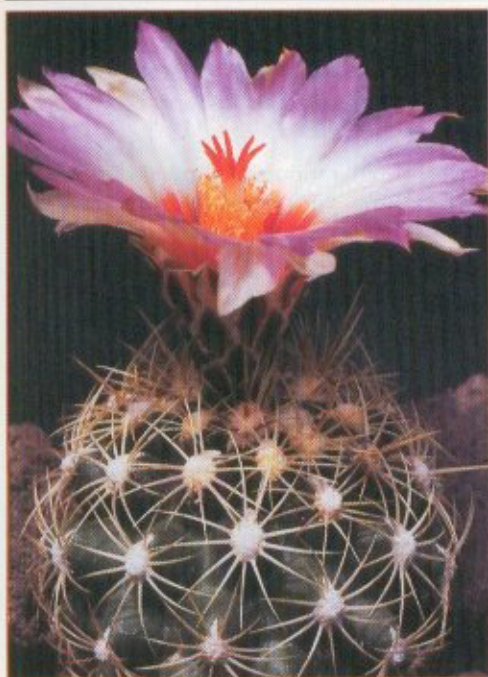
It is difficult to determine whether the plants which Benson has favoured with this name from the Big Bend area really are the same as were collected by Schott from much further east, and some field study in the Mier area seems to be needed to try and determine properly the standing of this variety.



var.
schwarzii

var. **schwarzii** (Backeberg) E. F. Anderson, Bradleya 5:61 (1987); Backeberg, Cact. Succ. J. Gr. Brit. 12: 81, 84 (1950) – as *Thelocactus schwarzii*; N. P. Taylor, Cact. Succ. J. Gr. Brit. 41(2):30 (1979); E. F. Anderson, Bradleya 5: 61 (1987); H. Bravo & H. Sánchez-Mejorada, Las Cact. México 183 (1991); E. F. Anderson, S. A. Montes & N. P. Taylor, Threatened Cacti of Mexico 81(1994)

This variety was described by Backeberg as solitary, to 6cm tall (Anderson gives up to 9cm, often clustering), bluish-green, about 5.5cm wide, with about 13 ribs (weakly distinct, vertically arranged). Radial spines 13 to 14, somewhat appressed to the body, yellowish, or at first with reddish base, later all yellow (grey in age), the 3 upper spines flattened and curving upwards, two of them to 17mm long, the other up to 27mm long. There is sometimes a solitary central spine. Flowers are reddish-purple, with scarlet throat, and a white zone above the throat, 8.5cm wide; anthers yellowish, style white, stigma-lobes reddish-scarlet. Backeberg, when describing it as a separate species, pointed out the differences from *T. bicolor* and varieties as the lack of central spines (but see above), more ribs (13 instead of 8), and the ribs made up of perfect tubercles.



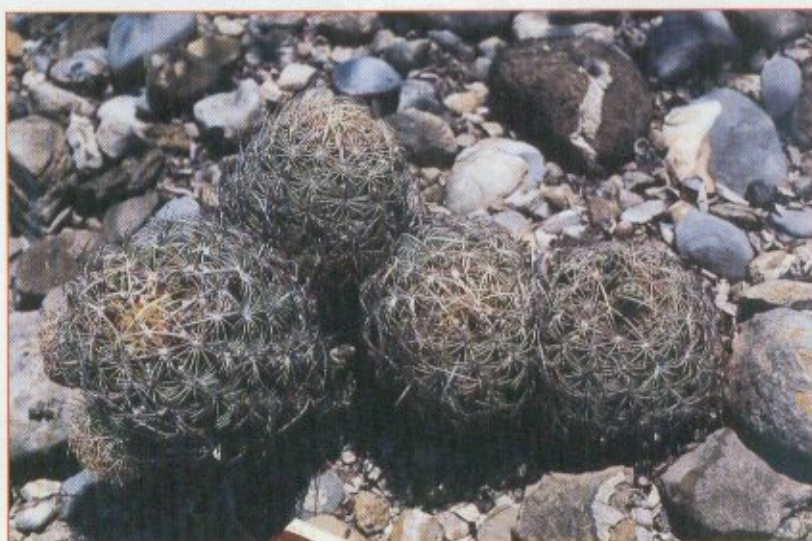
Reported from Tamaulipas, in heavy soil under bushes. Anderson adds that it is in the region of Llera, by route 81 between Llera and González; this presumably is the same as that reported in the *Threatened Cacti of Mexico* as "a fenced area south of Ciudad Victoria". This is strictly speaking outside the area of the Chihuahuan Desert, where the species in general occurs, but rather in what is known as Tamaulipan thorn forest; plants occur in the open and near associated shrubs.

Anderson recognizes this variety because of its comparatively restricted distribution, apparently outside the general range of the species, although it is dangerously close!

It is considered vulnerable in the recent excellent book *Threatened Cacti of Mexico*, mainly from agricultural development or grazing, but also from collecting, as it is known from only the one locality, and this is easily accessible and shared with that desirable cactus *Astrophytum asterias*. Perhaps the diversion of this latter species will make it less prone to attack from unscrupulous collection.

T. bicolor var. *schwarzii*,
in cultivation, plant
grown from commercial
seed

T. bicolor var. *schwarzii*,
in habitat, at type
locality, between Llera
and González,
Tamaulipas, Mexico



var.
texensis

var. **texensis** Backeberg, *Die Cact.* 6: 3872 (1962) *nom. inval.*; *Cact. Succ.* J. Gt. Brit. 12: 81 (1950); E. F. Anderson, *Bradleya* 5: 61 (1987)

This variety was described by Backeberg in volume 6 of his massive publication, *Die Cactaceae*, as a sort of appendix to his thoughts on this genus contained in volume 5.

He described a plant from Texas without more precise locality, with 12 to 13 red-spotted radial spines, and 4 central spines, the upper one longer, to 7.3cm, and erect. It has been declared invalidly described, and tends to be applied in commerce to any *T. bicolor* originating in Texas. Its separate standing is questionable.

**var.
tricolor**

var. **tricolor** (Schumann) Knuth, Backeberg & Knuth, Kaktus ABC 358 (1935); Schumann, Gesamtb. Kakt. 303 (1898) – as *Echinocactus bicolor tricolor*; A. D. Houghton, Cact. Succ. J. Amer. 1(10):197 (1930) illustration of plant in collection of Count F. M. Knuth; Backeberg, Die Cact. 5: 2811 (1962); E. F. Anderson, Bradleya 5: 61 (1987)

A popular name still with collectors, but randomly applied. Schumann described it as remarkably strong growing, very beautiful, with vivid, red coloured spines. Anderson barely mentions it in his revision, and merely as synonymous with the type.

**var.
wagnerianus**

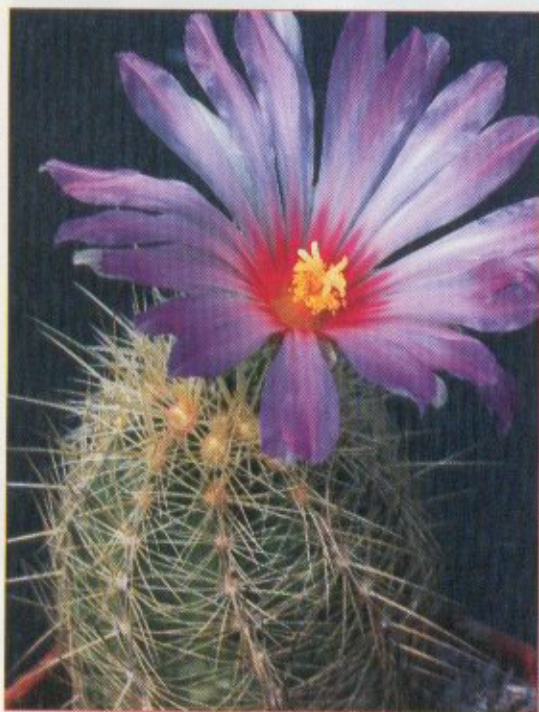
var. **wagnerianus** (A. Berger) Krainz, Die Kakteen, Lfg.18 (Oct. 1961); A. Berger, Kakteen 256, 346 (1929) – as *Echinocactus wagnerianus* and *Thelocactus wagnerianus*; Backeberg, Die Cact. 5:2811 (1961); E. F. Anderson, Bradleya 5:61 (1987); J. Chvastek, Kaktusy 30(3): 93-94 (1995)

Anderson rejects this variety (or species) reported hitherto vaguely only as from eastern Mexico, as having insufficient characters to be accepted as a separate variety of *T. bicolor*. Chvastek reports what he identifies as this taxon from hills near El Pilar, between Saltillo and Parras in Coahuila, and pictures a magnificent, heavily spined plant in habitat.

(Left) *T. bicolor* var. *wagnerianus*, in cultivation, plant grown from commercial seed

(Right) *T. bicolor* var. *wagnerianus* (?), in habitat, north of Estacion Marte, Coahuila, Mexico

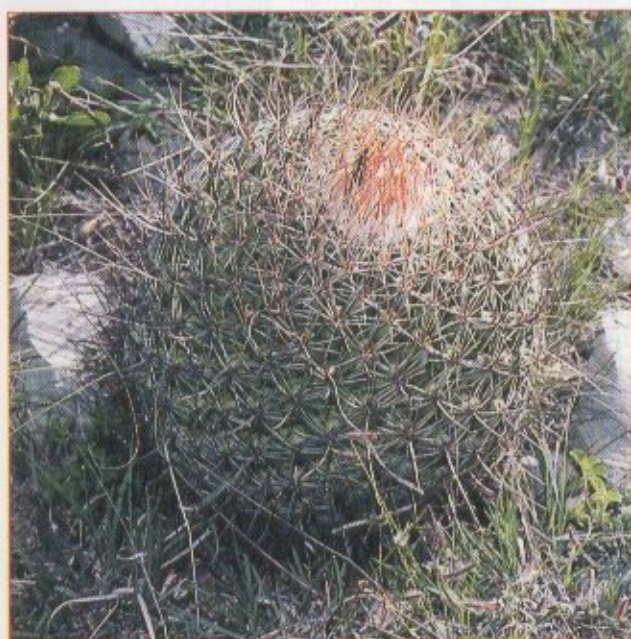
It was described by Berger as having stems 12 to 20cm tall or more, 5 to 6cm wide, clustering, with 13 ribs. Radial spines 20, strong, mostly reddish-yellow; there is at first one central spine, later 3 to 4, strong, standing out from the stem, 1.5 to 2cm long, red or yellow, or red and yellow in youth. It is generally applied to distinctive plants in cultivation with predominantly white to pale yellow spines, often red as they first emerge, with pale magenta flowers with red throat and a broad band of white between the two colours. These closely resemble the form of *T. bicolor* photographed by Nigel Taylor, from Coahuila, north of Estacion Marte.





Thelocactus conothelos

T. conothelos (Regel & Klein) Backeberg & F. Knuth, *Kaktus ABC*, 385 (1935); Regel & Klein, *Ind. Sem. Hort. Petrop.*, 48 (1860) – as *Echinocactus conothelos*; Britton & Rose, *The Cact.* 4:13 (1923) – as *Echinocactus conothelos*, but possibly referable to *Thelocactus*; Backeberg, *Die Cact.* 5: 2859 (1961) – as *Gymnocactus conothelos*; Glass & Foster, *Cact. Succ. J. (US)* 44(2):47-50 (1972); 49(5): 217 (1977) – as *T. conothelos*; E. F. Anderson, *Bradleya* 5: 66 (1987); H. Bravo-Hollis & H. Sánchez-Mejorada, *Las Cact. México* 2: 166 (1991)



T. conothelos var. *conothelos*, in habitat, north of San Luis Potosí City on Highway 57, San Luis Potosí, Mexico

Anderson expands the fairly brief original description of this species to take account of its considerable variability, although he rejects *T. conothelos* var. *macdowellii*, upholding it as a separate species in its own right. His description is as follows (somewhat abbreviated):

Stem usually single but occasionally clustering, 6 to 24 (exceptionally to 45)cm high, 7 to 17cm in diameter, globose to cylindrical, green to yellowish-green. Ribs indistinct and usually spiralling. Areoles usually without extrafloral nectaries. Central spines 1 to 4, 10 to 55mm long, becoming long and very dominant with age, reddish or reddish-white, becoming greyish-brown, sometimes becoming shredded, erect to somewhat spreading, straight, needle-like. Radial spines 10 to 23, 5 to 20mm long, similar but thinner, white to greyish-brown, straight. Flowers purple to magenta, white, yellow or orange, 3 to 4cm wide, 3 to 5cm long.

It is a widespread species occurring on limestone soils in the easternmost Chihuahuan desert and in thorn shrubland and pine forest in Nuevo León, Tamaulipas and San Luis Potosí, from 1000 to 2100 metres altitude.



var.
conothelos

The type, *T. conothelos* var. *conothelos*, is globose, solitary or occasionally clustering, 6 to 24 (exceptionally to 45)cm tall, 7 to 18cm wide, with the tubercles not obscured by the spines. Central spines 1 to 4, 13 to 55mm long, erect to somewhat spreading. Radial spines 8 or more, usually 14 to 16, 8 to 12mm long, white and somewhat glassy, straight to somewhat curved or twisted. Flowers magenta, purple, white (the white flowered form according to Glass and Foster occurring randomly throughout the range of the type), or rarely yellow; filaments are white, anthers orange-yellow, style dark purplish-pink, white to yellow-orange, stigma lobes 5 to 6, yellow. It is reported broadly from the area mentioned above, at 1500 to 1800m altitude, specifically from 23° to 24°5' N, and from 99°30' to 102° W.



**var.
argenteus**

var. **argenteus** Glass & Foster, Cact. Succ. J. (US) 44(2): 48 (1972); E. F. Anderson, Bradleya 5:68 (1987); E. F. Anderson, S. A. Montes, N. P. Taylor, Threatened Cacti of Mexico 84 (1994)

This is a geographically isolated variety from 7 to 10.5km west of La Ascensión, Nuevo León, in pine forest, on mountain ridges between the towns of Ascensión and Sandia.

It differs from the type according to Glass & Foster "principally in its greater spine count, the distinctive nature and colour of the spines, and by its isolated range."

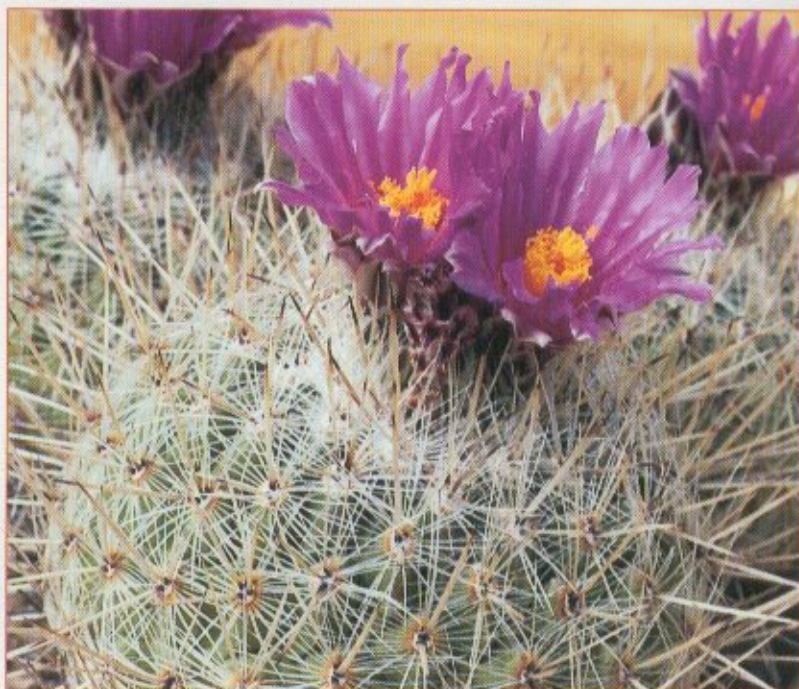
It was described as solitary, sub-globose, about 13cm in diameter, about 8cm tall, pale green, with ribs completely divided into prominent tubercles. Central spines 4, creamy white when young tipped yellow brown, becoming shredded and silvery with age, lower central spines standing out, 35 to 40mm long, the upper centrals 30 to 50mm long. Radial spines 20, glassy, silvery greyish-white, the lower spines about 13mm long, lateral and upper spines 20 to 30mm long, 2 to 3 times longer than the distance between the areoles, completely obscuring the tubercles. Flowers are pink to purple with a faintly darker mid-line, 3.5 to 4cm long, about the same wide; anthers and stigma lobes bright yellow

Reported from the locality as noted above, at 24°10' N and 99°58' W, at 2100m altitude.

It is considered vulnerable from unscrupulous collection, since the site is well known and accessible by road, but the area has not been thoroughly explored to determine whether it is as restricted as is at present thought. There is no immediate threat from agriculture or road development.



T. conothelos
var. *argenteus*, in
habitat, white flowered
plant, at Cerro Chico,
type locality, between
Ascensión and Sandia,
Nuevo León, Mexico



T. conothelos
var. *argenteus* (SB 311),
collected plants in
cultivation, from
Ascensión, Nuevo León,
Mexico



**var.
aurantiacus**

var. **aurantiacus** Glass & Foster, Cact. Succ. J. (US) 44(2):48 (1972); & 49(5):219 (1977); E. F. Anderson, Bradleya 5:68 (1987); E. F. Anderson, S. A. Montes & N. P. Taylor, Threatened Cacti of Mexico 88 (1994)

As with the previous variety this is maintained because of its isolation in the wild, its different flower colour, greater number of radial spines, and central spines differing in colour and shape.

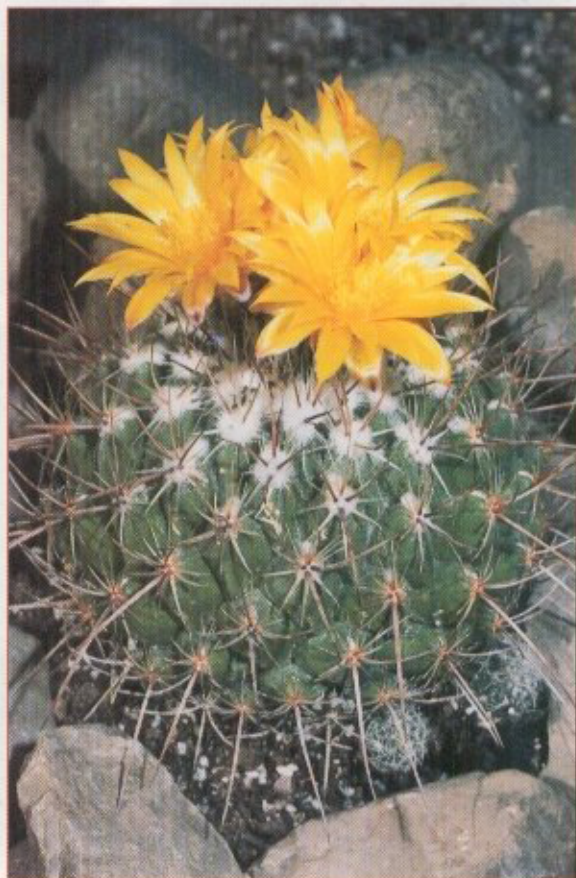
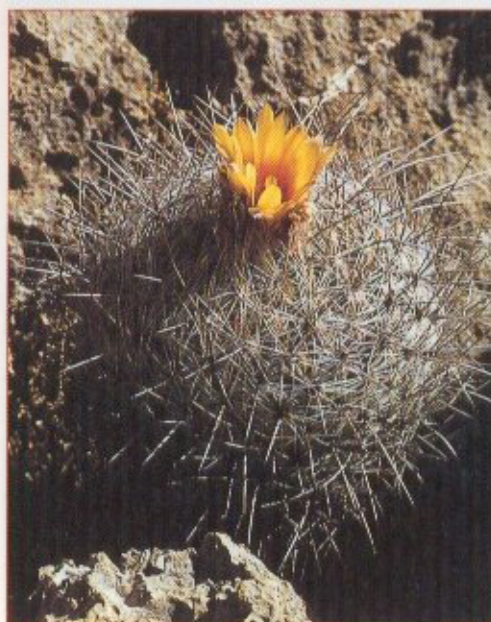
It was described as solitary, about 11cm wide, about 10cm tall, in the wild becoming occasionally somewhat columnar, pale green, the ribs completely divided into prominent tubercles. Central spines 4, straight and standing out, to slightly recurved to curving sideways, somewhat flattened, orange-yellow when young becoming greyish-brown, the lowest 20 to 55mm long, the upper 17 to 35mm long. Radial spines 17 to 23, stiff, glassy white, yellowish at base, about 10 to 20mm long. Flowers bright yellow to orange-yellow, about 38mm long (appearing in late spring and summer); anthers bright yellow, style and 8 stigma lobes yellow-orange.

Reported from limestone, rocky cliffs and hilltops (and relatively flat areas) just northwest of the town of Aramberri, Nuevo León, about 9 miles east of La Escondida specifically from 24° to 24°10' N and from 99°45' to 99°55' W, at 1000 to 1200m altitude.

This variety too is considered under threat from collectors, and many plants have been removed from near the road where it occurs. This area too needs responsible exploration to determine the extent of the variety.

(Below) *T. conothelos* var. *aurantiacus*, in habitat, north-west of Aramberri, Nuevo León, Mexico

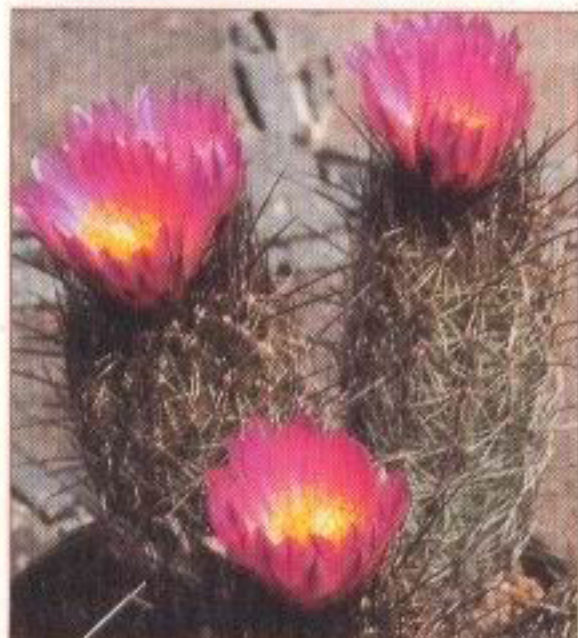
(Right) *T. conothelos* var. *aurantiacus*, in cultivation, plant grown from commercial seed





Thelocactus hastifer

T. hastifer (Werdermann & Bödeker) F. Knuth in Backeberg & Knuth, Kaktus-ABC 360 (1935); Werdermann & Bödeker, Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem, 11:104, 274-6 (1930-34) – as *Echinocactus hastifer*; Backeberg, Die Cact. 5:2811 (1961); E. F. Anderson, Bradleya 5: 58, 66 (1987); E. F. Anderson, S. A. Montes & N. P. Taylor, Threatened Cacti of Mexico 89 (1994); Alsemgeest, Bregman & van Veldhuisen, Succulenta 74(3): 125-129 (1995)



This is one of the rarest species of the genus, occurring at about the southernmost limit of the genus, in Querétaro, where I was taken to see it in 1994 in the wild by Manuel Rivas, a Mexican gentleman of Scottish descent [see *The Cactus File* 2(8):9, 1996].

It is described as usually single, clustering only after many years, from the base. In cultivation it was 15 years or more before specimens I grew from seed produced offsets. It has long, cylindrical stems, distinctly very narrow at the base, 10 to 30cm or more tall, often collapsing, or rather reclining, under its own weight, and sometimes seen in the wild coming horizontally out of cracks in large rocks, the growing point straining to keep upright. There are 12 to 18 narrow ribs, vertical or spiralling slightly. Areoles sometimes with or sometimes without extrafloral nectaries. Central spines 4 or

5, straight, needle-like, with one, dominant, very long spine; 10 to 14mm, the longer spine to 26mm, white to yellowish-brown, the centre spine becoming dark brown with age and erect, the others radiating slightly. Radial spines 20 to 25, 12 to 15mm long, white, darker as they age, straight, radiating. Flowers are pinkish-magenta, with paler throat, 3.5 to 5cm wide, 2.5 to 3cm long; filaments white, anthers yellow, style whitish-magenta, stigma lobes 5 to 7, yellow.

Reported to be very localized in the state of Querétaro, between Cadereyta and Vista Hermosa (a small village at the edge of the barranca of the Rio Moctezuma), at 1800 to 2000m altitude, from 20°30' to 21° N, and from 99°30' to 99°45' W.

Because of its very restricted occurrence it is considered an endangered species, but its remote occurrence makes it less likely to be under threat from collectors.



(Top) *T. hastifer*, in cultivation, a plant collected originally from habitat

(Bottom) *T. hastifer*, in cultivation, cutting from an old collected plant (pre-war)



Thelocactus heterochromus

T. heterochromus (F. A. C. Weber) van Oosten, *Kakteenkunde* 1940: 58 (1940), wrongly illustrated; Weber in Bois, *Dict. Hort.*, 466 (1896) – as *Echinocactus heterochromus*; Backeberg, *Die Cact.* 5:2801 (1961); Glass & Foster, *Cact. Succ. J. (US)* 49:247 (1977); N. P. Taylor, *Cact. Succ. J. Gr. Brit.* 41:90 (1979) – as *Ferocactus heterochromus*; E. F. Anderson, *Bradleya* 5:57, 68 (1987)

This is the westernmost species in the genus, and Anderson says that it appears both geographically and in physical characteristics to be intermediate between *T. bicolor* and *T. hexaedrophorus*. It is nevertheless a very distinct, handsome species, not common in collections, although it is available from time to time commercially, and is worth seeking out; the spination in particular is striking.

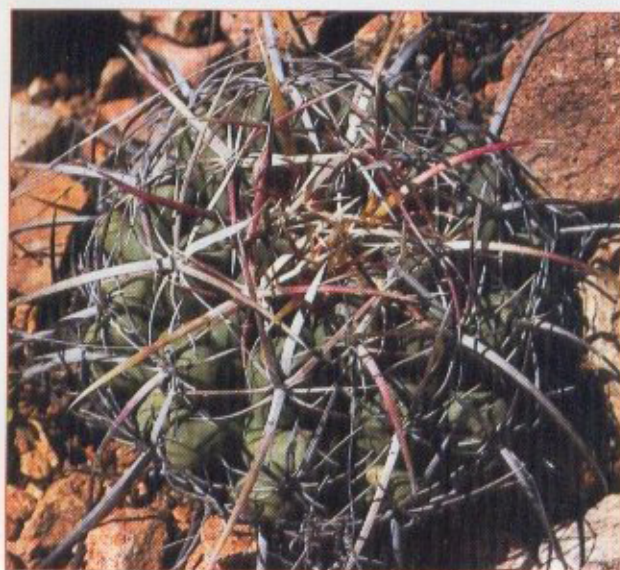


The description is of a single stem, 4 to 7cm tall, 6 to 15cm wide, globose to depressed-globose, green to bluish-green, with 7 to 11 ribs, divided into large tubercles to 2cm long and to 3cm wide. Areoles are elongated, extending to about half the length of the upper side of the tubercle or more, yellowish, without extrafloral nectaries. There is usually one central spine, but there are sometimes up to 4, 2 to 3cm long, reddish-yellow becoming darker with age, pointing downward, slightly curved. Radial spines 6 to 9, 16 to 28mm long, white to reddish-yellow, becoming reddish-black with age, radiating, more or less straight, but the upper one recurved. Flowers are magenta with very dark coloured throat, up to 10cm wide, and to 5.5cm long; filaments and anthers yellow, style whitish-yellow, stigma lobes 6 to 9 or more, reddish-purple.

It is reported from hill tops in limestone soil along the western edge of the Chihuahuan Desert, found in the states of Chihuahua, Durango and possibly Zacatecas, from 25°10' to 28°40' N and from 104° to 106°10' W, at 1200 to 1400m altitude. More specifically Anderson reports it from the vicinity of the town of Chihuahua; from Parral, Chihuahua; from rocky hills near Chihuahua; from west of La Solidar, Durango; and, with a question mark, from Zacatecas in the vicinity of "Fresno" (Fresnillo?).

(Top) *T. heterochromus*, ex habitat, Río Nazas Valley, Durango, Mexico

(Bottom) *T. heterochromus* (NPT 499), in habitat, El Rodeo, Durango, Mexico





Thelocactus hexaedrophorus

T. hexaedrophorus (Lemaire) Britton & Rose, Bull. Torrey Bot. Club 49: 251 (1922); The Cact. 4:6 (1923); Lemaire, Cact. Gen. Nov. Sp. 27 (1839) – as *Echinocactus hexaedrophorus*; Icon. descr. Cact. Part 1, plate 2 (1841), designated by Anderson as the neotype; Backeberg, Die Cact. 5:2799 (1961); Glass & Foster, Cact. Succ. J. (US) 49(5):215 (1977); E. F. Anderson, Bradleya 5:57, 69-72 (1987); Alsemgeest, Bregman & van Veldhuisen, Succulenta 74(6): 274-279 (1995)

This is a plant I have seen commonly in the northern parts of the state of San Luis Potosí, and in southern Nuevo León. It occurs also in south-western Tamaulipas, and just into western Zacatecas, with the variety *lloydi* apparently a separate entity in northern Zacatecas. It is also reported recently by the Dutch Study Group from southern Coahuila and eastern Durango, giving it a wider distribution still.

In cultivation it makes a low, large-tubercled, glaucous green, strongly spined, tough looking plant, which will go on for many years, getting a little larger every year, but not usually exceeding about 15cm in diameter.



T. hexaedrophorus
var. *hexaedrophorus*, in
cultivation, plant grown
from commercial seed



**var.
hexaedrophorus**

The type is described as single, rarely clustering, 4.5 to 7.5cm tall, 8 to 15cm wide, globose to flattened-to sometimes depressed-globose, green to deep olive-green, sometimes bluish-grey, with indistinct ribs. The tubercles are described as large, rounded or hemispherical, 8 to 20mm long, 13 to 26mm, rarely to 40mm, broad. Areoles are on top of the tubercle with a distinct groove, 4 to 13mm long, without extrafloral nectaries. The single central spine (sometimes not present) is reddish, more or less erect, straight. Radial spines 4 to 6, 5 to 35mm long, reddish to greyish-white, erect to spreading, straight. Flowers are white with pink midstripe, or sometimes completely white, to 5cm wide, to 3.5cm long; filaments are white, anthers yellow, style white, stigma lobes 5 to 11, creamy yellowish-white.

It is reported from 21°50' to 24°25' N and from 99°45' to 103°10' W, at 1100 to 2300m altitude, in limestone soils in the Chihuahuan Desert, in savannah and grasslands in the states of San Luis Potosí, Zacatecas, Tamaulipas and Nuevo León; more recently from Cuernamé, Durango, and from La Mancha in southern Coahuila.

**var.
decipiens**

var. **decipiens** Berger, Kakteen 253 (1929); Backeberg, *Die Cact.* 5:2800 (1961); Glass & Foster, *Cact. Succ. J. (US)* 49(5): 216 (1977)



There is a very short description of this variety in Backeberg's *Die Cactaceae*, which says that it is dark green, with recurving, appressed, dull yellowish-brown spines. Glass and Foster in their review of 1977 mention a form of *T. hexaedrophorus* occurring near Buenavista, San Luis Potosí, with green rather than bluish stem and pale, rose-coloured flowers, "for which an argument for varietal status could be made", and they compare it with either var. *decipiens* or var. *roseus*, but they go on to say that "until further field studies should show an overall pattern to the variations within the species, such separations seem to be of little value".

T. hexaedrophorus var. *hexaedrophorus*, in cultivation, ex habitat, La Mancha, Coahuila, Mexico

**var.
droegeanus**

var. **droegeanus** (Hildmann ex Schumann) Berger, Kakteen 253 (1929); Hildmann ex Schumann, *Gesamtb. Kakt.* 438 (1898)

Another one-line reference in Backeberg's *Die Cactaceae* mentions ash-grey, closely compressed tubercles, clearly little differentiated from the type.

**var.
fossulatus**

var. **fossulatus** (Scheidweiler) Backeberg, Die Cact. 5:2800 (1961); Scheidweiler, Allg. Gartenz. 9:49 (1841) as *Echinocactus fossulatus*; Pfeiffer & Otto, Abbild. Beschr. Blüh. Cact. Vol.2, plate 13 (1847), designated by Anderson as the neotype; Britton & Rose, The Cact. 4:10 (1923) – as *Thelocactus fossulatus*; Glass & Foster, Cact. Succ. J. (US) 49(5): 216 (1977); E. F. Anderson, Bradleya 5: 69 (1987)

With the type locality given merely as San Luis Potosí, Mexico, and no accompanying illustration, Anderson maintains that determination of this taxon as a separate species or a variety of *T. hexaedrophorus* is impossible: *T. hexaedrophorus* was probably originally sent from the same area, and the range of variation in this widespread species is such that 'fossulatus' is a superfluous name.



T. hexaedrophorus
var. *hexaedrophorus*
(*fossulatus*), large grey
form, in cultivation, ex
habitat, south of
Matehuala, near La
Bonita, San Luis Potosí,
Mexico

**var.
labouretianus**

var. **labouretianus** (Schumann) Berger, Kakteen 253 (1929); Schumann, Gesamtb. Kakt. 438 (1898); Backeberg, Die Cact. 5:2800 (1961)

Described as having more defined ribs, but with such a minor difference, any rank is not justified.



**var.
lloydii**

var. **lloydii** (Britton & Rose) Kladiwa & Fittkau in Krainz, Die Kakteen, Lfg. 61 (Jan.1975); Britton & Rose, The Cact. 4:11 (1923) – as *T. lloydii*; Backeberg, Die Cact. 5:2808 (1961) – as *T. lloydii*; Glass & Foster, Cact. Succ. J. (US) 49(5):216 (1977); E. F. Anderson, Bradleya 5:57, 60, 72 (1987)

Glass and Foster dismiss this together with all the numerous varietal names attributed to this widespread, variable species, but concede that a weak case could be made for upholding it "as the westernmost form of the species which is generally a smaller plant with more regular spirals of tubercles and more regular spination". Anderson however maintains it apparently for its geographic isolation in the state of Zacatecas, showing on his distribution map a gap of some 100km between this and the type. Further fieldwork may reveal that this is tenuously based.



It is described as follows: stem 3 to 6cm tall, 8 to 12cm wide, deep olive-green, with tubercles deltoid-shaped, 15 to 20mm long, 13 to 18mm, to exceptionally 40mm, wide. Central spines 1 to 3, 20 to 25mm long, reddish-white to brownish. Radial spines 6 to 8, 15 to 22mm long, reddish-white to brownish. Flowers white with magenta midstripe, to about 3.5cm wide; filaments are white, anthers yellow, style yellow, stigma lobes 5 to 11, creamy yellowish-white.

Reported from high elevations, 2200 to 2300m in savannah and grassland in the state of Zacatecas, from 22°50' to 24°10' N and from 102°30' to 103°20' W.

T. hexaedrophorus var. *lloydii*, in cultivation, plant grown from commercial seed

var.
major

var. **major** (Quehl) Berger, Kakteen 253 (1929); Quehl, Monatsschr. Kakt.-Kunde 4:29 (1894)

Described as having spines 3cm long, and a handsome red colour. Again a minor variation, not justifying separate consideration.

var.
paradensis

var. **paradensis** nom. nud.

According to the Dutch Study Group this varietal name, which has appeared on plants from eastern Europe, is similar to var. *lloydii* as it occurs near Fresnillo.

(var.)
roseus

(var.) **roseus** Lemaire ex Labouret, Monogr. Cact. 251 (1853)

Even Backeberg did not consider this worth more than a mention in the synonymy of *T. hexaedrophorus*.

(var.)
subcostatus

(var.) **subcostatus** Salm-Dyck, Cact.Hort. Dyck1849:34 (1850)

Similarly to the preceding variety Backeberg merely mentions it in the synonymy of *T. hexaedrophorus* var. *fossulatus*.

It cannot be emphasized enough that this is an extremely variable species with a very wide range. The Dutch Study Group identify several distinct forms: an eastern form, from around Aramberri, Nuevo León, where large, broad plants are found, with spiralling ribs and heavy spination, particularly on plants from slightly further south, near Miquihuana; a form from Fresnillo (probably synonymous with var. *lloydii*), narrower in body shape, and with red brown spines; a form from Cuencamé, Durango, making broad, flat plants with heavy spination; and a form in northern Durango and La Mancha in Coahuila with extremely long and heavy spines. But the standing of these or any other forms of this species is questionable, and a comprehensive study of this species over its whole area would seem to be called for.

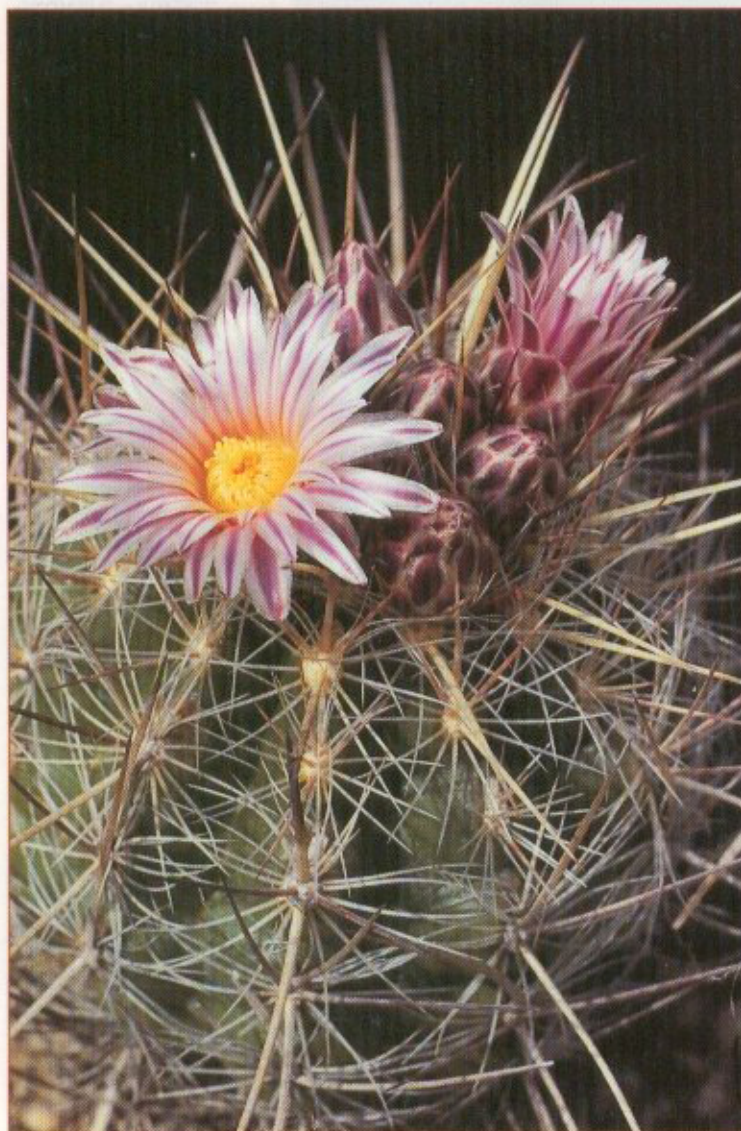


Thelocactus lausseri

T. lausseri J. Riha & J. Busek, Kakt. u. a. Sukk. 37(8): 162-4 (1986); A. Lausser, Kakt. u. a. Sukk 37(6):126-7 (1986); E. F. Anderson, Bradleya 5:58, 68 (1987)

In June 1986 Alfons Lausser wrote about an apparently new cactus species he had come across in the Sierra de las Ovejas in Coahuila, near Cuatrociénegas. This account was followed two months later by a description of this new *Thelocactus* species named after the finder by Dr. Jan Riha and Josef Busek of Czechoslovakia and Germany respectively. This is the last species described in this genus, and seedlings have appeared commercially in the last few years.

It is one of the most beautifully spined species in the genus, with long red and yellow spines its main feature; its flowers are striped in the manner of some *Stenocactus* species.



It was described as having single stems, globose to short-elongate, 7 to 10cm tall, 5 to 8.5cm wide, grey-green, with 8 to 10 ribs, slightly spiralling. Areoles without extrafloral nectaries. Central spines 4 (seldom 5 or 6), 60 to 105mm long (that is over 4 inches for the unconverted!), 2.5mm thick at the base, red to reddish-yellow to whitish-yellow to whitish-grey when older. Radial spines 20 to 22 (or to 25), 18 to 20 (or to 28)mm long, 1mm thick at the base, silvery white to rarely yellowish, not erect. Flowers whitish to pale pink, with darker midstripe, 3.6cm long and wide; filaments are pink to white, anthers yellow, style yellow to whitish, stigma lobes 5 to 8 yellowish.

It occurs on limestone soils in the state of Coahuila, from the Sierra de las Ovejas, near Cuatrociénegas.

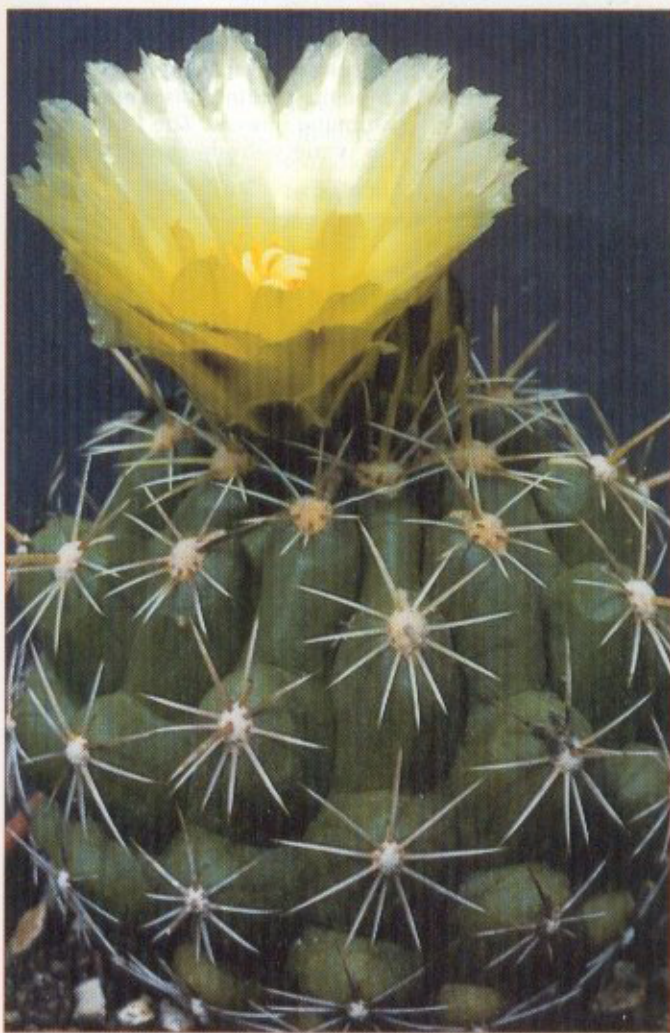
T. lausseri, in cultivation, ex habitat in the Sierra de las Ovejas, Coahuila, Mexico



Thelocactus leucacanthus

T. leucacanthus (Zuccarini) Britton & Rose, The Cact. 4:8 (1923); Zuccarini in Pfeiffer, Enum. Cact. 66 (1837); Backeberg, Die Cact. 5:2815 (1961); Glass & Foster, Cact. Succ. J. (US) 49(5): 214-5 (1977); E. F. Anderson, Bradleya 5: 57, 62 (1987); Alsemgeest, Bregman & van Veldhuisen, Succulenta 74(2): 74-80 (1995)

This is singled out by Anderson as the species showing the most primitive characters. It is the southernmost species, often forms clusters, has a more apparent rib structure than the more tuberculate form of many species, has extrafloral nectaries, a character it shares only with *T. setispinus* and *T. bicolor*, and sometimes *T. hastifer* (which to confuse matters thoroughly sometimes has them and sometimes does not), and has what Anderson describes as a relatively simple, pyriform (pear-shaped) seed. It varies throughout its range in spination and in flower colour, and because of this Anderson does not recognize any of the named varieties, based mainly on differing flower colour, or spination.



It is described as commonly clustering and forming clumps to 80cm across, with stems from 4.5 to 15cm tall, 2.5 to 5cm wide, globose to globose-cylindrical, yellowish-green. Ribs number from 7 to 14, vertical to spiralling. Areoles have extrafloral nectaries. There is sometimes one central spine, 9 to 50mm long, yellowish-white to nearly black with age, straight, erect, needle-like, often not present. Radial spines 6 to 20, 5 to 7mm long, yellowish-white, sometimes becoming reddish or greyish, radiating, straight to somewhat recurved. Flowers are yellow, violet or carmine-red, 2 to 4.5cm wide, 2.5 to about 5cm long; filaments are yellowish-green, anthers yellow, style light magenta, stigma lobes 5 to 6.

It occurs in limestone soils in succulent shrub forest in the states of Hidalgo and Querétaro, from 20°10' to 20°55' N, and from 99°10' to 100° W, at 1200 to 1900m altitude; reported specifically from between Zimapan and Ixmiquilpan.

T. leucacanthus in cultivation, plant grown from commercial seed

var.
porrectus

var. **porrectus** (Lemaire) Backeberg, Die Cact. 5:2818, fig. 2650 (1961); Lemaire, Cact. Aliq. Nov. 17 (1838) – as *Echinocactus porrectus*; F. Knuth in Backeberg & Knuth, Kaktus-ABC 361 (1935) – as *T. porrectus*

A variety with one, prominent, long central spine, of little significance in view of the variation of the species, and the lack of cited locality, except “Mexico” in the original description.

var.
sanchezmejoradai

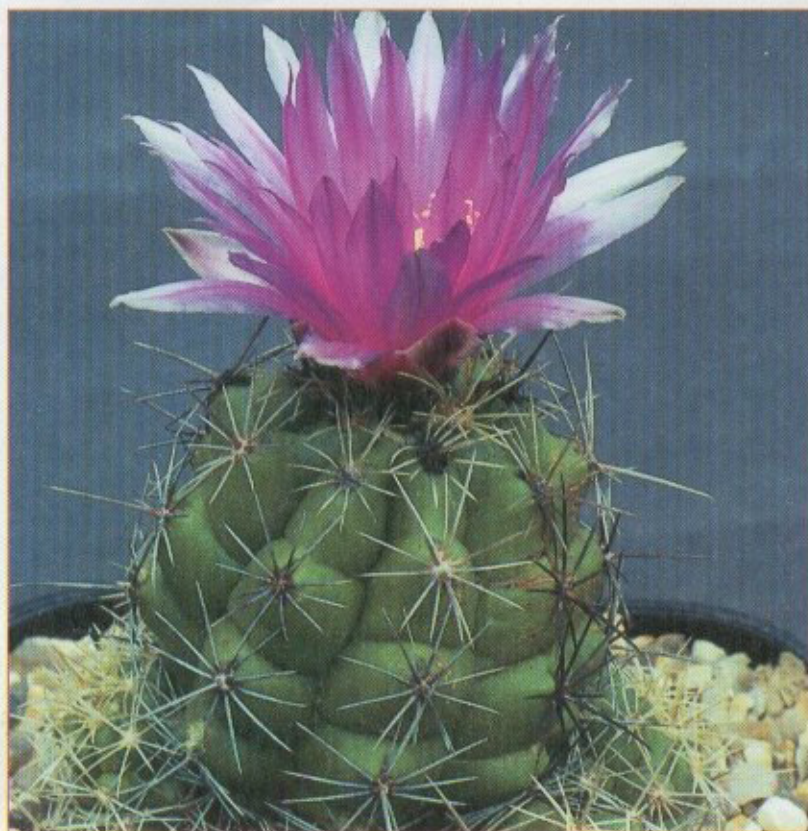
var. **sanchezmejoradai** (Meyrán) Backeberg, Die Cact. 5:2817 (1961); Meyrán, Cact. Suc. Mex 3(4):77 (1958) – as *T. sanchezmejoradai*; E. F. Anderson, Bradleya 5: 62 (1987)

Dismissed by Anderson as synonymous with *T. leucacanthus*, this variety was described (as a species) from 15km east of Cadereyta des Montes in Querétaro, on hills between Cerro Pico de Gallo and Cerro Prieto; it is similar to var. *schmollii*, with minor floral differences, according to Backeberg.

var.
schmollii

var. **schmollii** Werdermann, Blüh. Kakt. and. Sukk. Pfl. Taf. 160 (1939); E. F. Anderson, Bradleya 5: 62 (1987)

Werdermann did not know where Schmoll collected this variety, and Anderson dismisses it as merely a flower colour variant, maintaining that the flower colour varies throughout the range of the species. However the name will undoubtedly cling on to differentiate the striking flower colour break of magenta to deep purple, which plants bearing this name have. It is certainly worth seeking out for the stunning flowers. The Dutch Study Group report plants attributed to this variety from Querétaro, near Vizarrón des Montes and Cerro Prieto.



T. leucacanthus
var. *schmollii*, in
cultivation, plant grown
from commercial seed



Thelocactus macdowellii

T. macdowellii (Rebut ex Quehl) C. Glass, *Cact. Suc. Mex.* 14(1):4 (1969) – as *T. mcdowellii*; Rebut & Quehl, *Monatsschr. Kakt.-Kunde* 4: 133-4 (1894) – as *Echinocactus* Mc. Dowellii; Britton & Rose, *The Cact.* 3:151 (1922) – as *Echinomastus macdowellii*; Glass & Foster, *Cact. Succ. J. (US)* 49(5): 220 (1977) – as *T. conothele* var. *mcdowellii*; E. F. Anderson, *Bradleya* 5: 58, 64 (1987); E. F. Anderson, S. A. Montes & N. P. Taylor, *Threatened Cacti of Mexico* 92 (1994)

Glass and Foster placed this species as a variety of *T. conothelos*, but Anderson reinstates it as a good species on the basis of its testa characters, which “are like those of *T. leucacanthus* and *T. hexaedrophorus*, and the flower tube is much shorter than that of *T. conothelos*”. He goes on to suggest that other characters of this species suggest it may be a link to the genus *Neolloydia* or *Gymnocactus* if you recognize that genus, “the flowers having only a few scales on the ovary, dense spination, smaller body size, and a more northern distribution.” He also invokes the International Code for Botanical Nomenclature, Article 73.C, with regard to the spelling of the name; this article recommends that Scottish prefixes (i.e. Mc and Mac) be united with the family name as “mac”.

It is described as single or clustering, more often seen in cultivation as single heads, with stems 4 to 9.5cm tall, 4.5 to 12cm wide, globose to elongate, green to pale green, with indistinct ribs, and areoles without extrafloral nectaries. Central spines 2 or 3 (occasionally 4), 11 to 25 (rarely to 50)mm long, white to greyish-white, radiating, straight. Radial spines 15 to 25, 8 to 12 (rarely to 20)mm long, white, becoming brownish-grey with age, radiating, straight, needle-like, densely covering the body. Flowers are magenta, with slightly paler margins to the petals, 3.5 to 5cm wide, 4 to 4.5cm long; filaments are yellowish, anthers yellow, style magenta, stigma lobes 4 to 6, yellow.

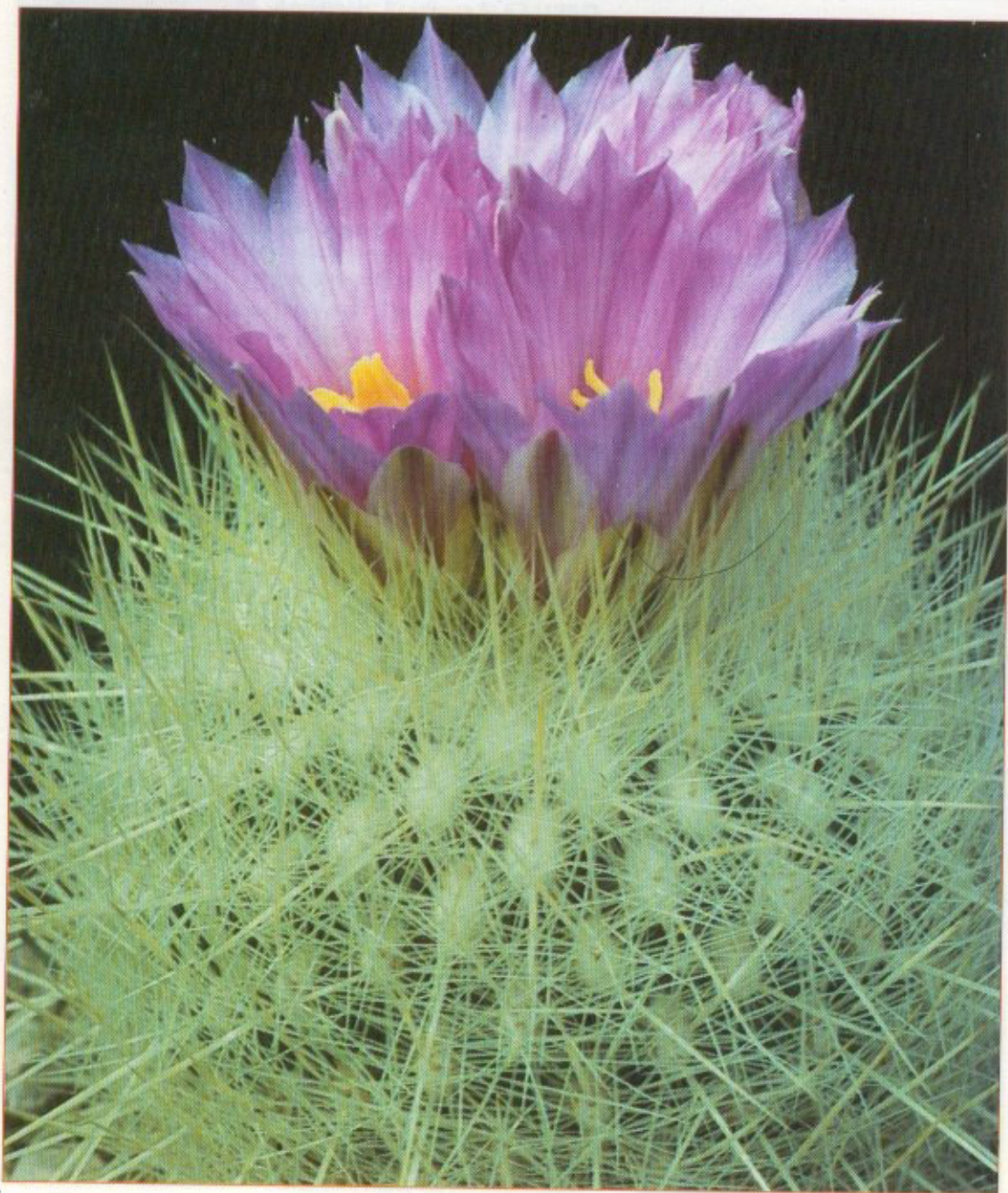
T. macdowellii, in habitat, growing with *Agave lechuguilla* in Huasteca Canyon, north of Monterrey, Coahuila on the border with Nuevo León, Mexico

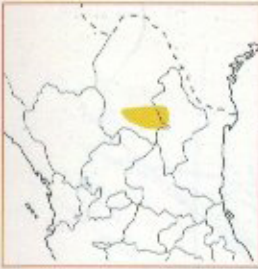


Reported to occur only on limestone soils in the states of Coahuila and Nuevo León, specifically from 25°30' to 25°45' N, and from 100°40' to 101° W, at about 1500m altitude.

T. macdowellii, in
cultivation, commercial
plant

At present the area in which this species grows is reported to be not easily accessible as the owners do not allow entry to their land, although David Rushforth's account of finding it in a canyon which could be driven into from the tarmac road (*The Cactus File* 2(2):3 1994) indicates that there may be back door access! Until the extent of the population is determined however it is regarded as vulnerable.





Thelocactus rinconensis

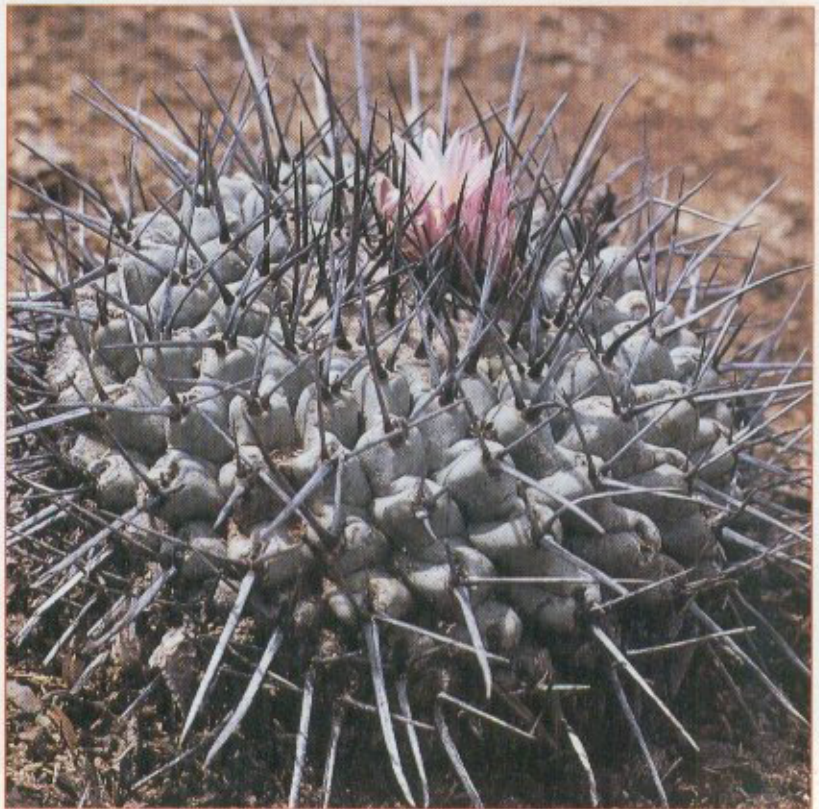
T. rinconensis (Poselger) Britton & Rose, The Cact. 4:7 (1923); Poselger, Allg. Gartenz. 23:18 (1855) – as *Echinocactus rinconensis*; K. Schumann, Gesamtb. 433 (1898) – as *Echinocactus rinconadensis*; Backeberg, Die Cact. 5: 2803 (1961); Glass & Foster, Cact. Succ. J. (US) 49(6): 244 (1977); E. F. Anderson, Bradleya 5:57, 72 (1987); A. Lux, J. Verduzco & M. Zachar, Kakt. u.a. Sukk. 42(11): 264-267 (1991)

This is the species of *Thelocactus* with the largest individual stem, specimens in the wild (and potentially in cultivation) getting to 20cm wide. It is an extremely variable species in the length of spines, and this has given rise in the past to several names for the different forms, which, according to Anderson occur throughout its range, and so invalidate any consideration of the rank of variety (or subspecies). Britton and Rose's description of *T. rinconensis* is of a solitary stem, globose or somewhat depressed, 6 to 8cm tall, 12cm wide, with somewhat spiralling ribs, strongly tubercled, the tubercles more or less flattened laterally, somewhat angled; spines usually only 3, needle-like, 1.5cm long; flowers white, 4cm long.



var.
rinconensis

Glass and Foster expand the description from their field observations to report that the stem is usually solitary, depressed globose to quite flattened, about 12 to 15 (to 20)cm in diameter, to 8cm tall, glaucous blue to occasionally grey-green, the ribs strongly tuberculate, with few



T. rinconensis
var. *rinconensis*,
in habitat



T. rinconensis
var. *rinconensis*
(SB 301), in cultivation,
ex habitat, Rinconada,
Nuevo León, Mexico

(generally 2 to 3) tubercles per rib, more or less flattened laterally and somewhat angled; areoles large, woolly in youth, obscurely arranged in 13 and 21 spirals (Anderson reports that it has no extrafloral nectaries); central spines up to 4, variable in number and quality, heavy, stiff, often shredding with age. Flowers are large, 4cm long and about the same wide, variable from white to pale yellowish, or with a pinkish midstripe to deep magenta; filaments are white, anthers orange-yellow, style white, stigma-lobes 7 to 12, cream coloured. *T. rinconensis* in the narrow sense is reported from La Rinconada, north-east of Saltillo on the way to Monterrey but see below. They then recognize as varieties former species *T. nidulans* and *T. phymatothele*.

var.
freudenbergeri

var. **freudenbergeri** Haas, Kakt. u.a. Sukk. 43(5): 96-98 (1992)

This is a recent varietal name erected for a form of this variable species having violet-pink flowers with a darker midstripe and more spines than others in the species, one long, straight, central spine from 40 to 100mm long, and 7 to 9 more radially placed, 15 to 80mm long. Given the variability of this species it is not significantly different.



var.
nidulans

T. rinconensis
var. *nidulans*, in
cultivation, ex habitat

var. **nidulans** (Quehl) Glass & Foster, Cact. Succ. J. (US) 49(6):245 (1977); Quehl, Monatsschr. Kakt.-Kunde 21: 119 (1911) – as *Echinocactus nidulans*.

This variety is described as differing in its generally larger size, 18 to 20cm in diameter, the presence of radial spines, mostly short, about 5mm long, but occasionally up to 30mm long, and the 4 long central spines (to 6cm), the lowest generally the longest, descending, the spines heavy, straight to slightly curved, occasionally twisted, sharp, but becoming extremely shredded and silvery with age, the flowers similar to the type, but with occasionally magenta flowers.

Glass and Foster report it from the Sierra de la Paila, at El Chiffon, west of Saltillo, north-east of San Pedro, in south-western Coahuila on the road to Cuatrociénegas, the magenta flowered form from west of Monterrey on the road to Icamole.

As stated above Anderson would have none of this variety, saying that the differing spination occurs throughout the range of the species.





var.
phymatothelos

T. rinconensis
var. *phymatothelos*, in
cultivation, plant
grown from
commercial seed

var. **phymatothelos** (Poselger) Glass & Foster, *Cact. Succ. J. (US)* 49(6): 246 (1977) – as *T. rinconensis* var. *phymatothele*; Britton & Rose, *The Cact. 4:8* (1923) – as *T. phymatothele*; Poselger ex Rümpler in Förster, *Handb. Cact. ed.2: 602* (1885) – as *Echinocactus phymatothele*; Backeberg, *Die Cact. 5: 2803* (1961) – as *T. phymatothelos*; E. F. Anderson, *Bradleya 5: 72* (1987) (the spelling corrected to 'phymatothelos')

This variety, spelled correctly *T. rinconensis* var. *phymatothelos* according to Anderson, is described by Glass and Foster as having a stem up to 15cm in diameter, more often about 9 to 10cm, extremely depressed and compressed to obscure the rib structure. Only central spines are present, short, from 2mm long, and occasionally 20 to 35mm long, sometimes not present at all, curved, heavy, stiff, rarely shredding in the way of var. *nidulans*; flowers are white with pink midstripe, otherwise similar to the type.

Reported only from the slopes of Arteaga Canyon, just south of Saltillo in the state of Coahuila.

Anderson would have none of this variety either, merely correcting the spelling to that originally used, offering a locality and neotype for what seems to be the plant applying here, i.e. near Saltillo, and then reducing it to synonymy with the type.

As generally applied in cultivation, this plant is as described and depicted by Glass and Foster, and is a handsome form, worth seeking out.





var.
phymatothelos

T. rinconensis
var. *phymatothelos*, in
cultivation, plant
grown from
commercial seed

var. **phymatothelos** (Poselger) Glass & Foster, *Cact. Succ. J. (US)* 49(6): 246 (1977) – as *T. rinconensis* var. *phymatothele*; Britton & Rose, *The Cact. 4:8* (1923) – as *T. phymatothele*; Poselger ex Rümpler in Förster, *Handb. Cact. ed.2: 602* (1885) – as *Echinocactus phymatothele*; Backeberg, *Die Cact. 5: 2803* (1961) – as *T. phymatothelos*; E. F. Anderson, *Bradleya 5: 72* (1987) (the spelling corrected to 'phymatothelos')

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Thelocactus setispinus

T. setispinus (Engelm.) E. F. Anderson, *Bradleya* 5: 50-1, 57, 59 (1987); Engelm., *Boston J. Nat. Hist.* 5: 246 (1845) – as *Echinocactus setispinus*; Britton & Rose, *The Cact.* 3: 104 (1922) – as *Hamatocactus setispinus*; L. Benson, *Cact. Succ. J. (US)* 43(3): 128 (1969) – as *Ferocactus setispinus*

There is little general sign of discarding the more familiar name which is attached to this species, *Hamatocactus setispinus*, although the genus *Hamatocactus* has been standing on one leg as it were since *Hamatocactus hamatacanthus* (known for short by some as Ham squared) was transferred to *Ferocactus*.

Anderson offers very cogent reasoning for its amalgamation with *Thelocactus*, comparing it with *T. bicolor*. In a paper comparing the four species *H. setispinus*, *H. hamatacanthus*, *T. bicolor* and *T. hexaedrophorus* Nigel Taylor studied 30 characters to determine relationships, of which only 19 showed variation within these four species. While the two *Hamatocactus* were similar in 7 characters, they differed in 12 characters, but 10 of the characters were alike in *H. setispinus* and *T. bicolor*; this means that 21 of the 30 characters studied were similar in these two species. However *H. setispinus* had only 4 of the 19 characters similar to *T. hexaedrophorus*, a species having more characters in common with other species of the genus *Thelocactus* than *T. bicolor*. Confusing isn't it?

Faced with the alternatives of (A) retaining *Hamatocactus* as a monotypic genus and ignoring its close relationship with *T. bicolor*; (B) transferring *T. bicolor* to *Hamatocactus* to join *H. setispinus*; and (C) amalgamating *H. setispinus* with *Thelocactus* in a broader definition of *Thelocactus*, Anderson chose alternative (C).

T. setispinus is described as single, rarely clustering (an occasional heavily clustering specimen is seen in cultivation), 7 to 12cm tall, 5 to 9cm wide, globose to elongate-globose, yellow-green to blue-green, with 12 to 15 narrow, sinuous ribs; tubercles are not apparent; areoles have extrafloral nectaries. There is one central spine, yellowish-white to reddish with light coloured tip, 16 to 27mm long, erect, hooked, round in section. Radial spines 9 to 17, whitish to reddish-white, 9 to 24mm long, radiating, straight, needle-like. Flowers are yellow, deep red in the throat, about 3 to 4cm wide, 4 to over 5cm long; filaments

T. setispinus, in cultivation, plant grown from commercial seed



are reddish to whitish, anthers light yellow, stigma lobes 7 to 9, light yellow to white. Fruit is red, round, not dehiscent at the base. This is unlike all other species, which have green or brown, round to elongated fruit, dehiscent at the base to release the seed.

This species is found in thorn shrubland in southern Texas and north-eastern Mexico, in the states of Coahuila, Nuevo León and Tamaulipas, from 23°10' to 29°55' N and from 97°10' to 101°40' W from sea level to 550m altitude.

Anderson dismisses varietal names attached to this species, based on variations in spination and flowers. They are as follows:

var.
cachetianus

var. **cachetianus** (Labouret) F. Knuth in Backeberg & F. Knuth, *Kaktus - ABC* 353 (1935) – as *Hamatocactus setispinus* var. *cachetianus*; Labouret, *Monogr. Cact.* 203 (1853) – as *Echinocactus setispinus* var. *cachetianus*.

A variety proposed for a larger flower, and slight variations in body and spines.

var.
hamatus

var. **hamatus** (Muehlenpfordt) Borg, *Cacti* 218 (1937); Muehlenpfordt, *Allg. Gartenz.* 16: 18 (1848) – as *Echinocactus hamatus*; Engelmann, *Boston J. Nat. Hist.* 6: 201 (1850) – as *Echinocactus setispinus hamatus*.

Type locality given only as Texas, with no illustration.

var.
mierensis

var. **mierensis** Schumann, *Gesamtb. Kakt.* 340 (1898) – as *Echinocactus setispinus* var. *mierensis*.

A variety based on somewhat different spination.

var.
muhlenpfordtii

var. **muhlenpfordtii** Coulter, *Contr. U. S. Nat. Herb.* 3: 370 (1896) – as *Echinocactus setispinus muhlenpfordtii*.

No illustration accompanied the original description, and its referral to this species by Britton and Rose is questioned.

var.
orcuttii

var. **orcuttii** Schumann, *Gesamtb. Kakt.* 340 (1898) – as *Echinocactus setispinus* var. *orcuttii*.

A variety similarly based on variations in spination.

var.
setaceus

var. **setaceus** (Engelmann) W. T. Marshall, *Cact. Succ. J. (U.S.)* 16: 80 (1940) – as *Hamatocactus setispinus* var. *setaceus*; Engelmann, *Boston J. Nat. Hist.* 6: 201 (1850) – as *Echinocactus setispinus setaceus*.

Described by Engelmann as a smaller, more northern form with more and thinner spines.

Britton and Rose also referred the following to synonymy with *T. setispinus*:

Echinopsis nodosa Linke, *Wochenschr. Gartn. Pflanz.* 1: 85 (1858); *Echinocactus nodosus* Hemsley, *Biol. Centr. Amer. Bot.* 1: 535 (1880); *Echinocactus hamulosus* Regel, *Ind. Sem. Hort. Petrop.* 34 (1856); *Echinocactus setispinus martelii* Garde frér. in Schelle, *Handb. Kakteenk.* 159 (1907).

In general this species grows more quickly than most others, and presents no problems in cultivation, flowering at about three years from seed.



Thelocactus tulensis

T. tulensis (Poselger) Britton & Rose, The Cact. 4: 11 (1923); Poselger, Allg. Gartenz. 21:125 (1853) – as *Echinocactus tulensis*; Backeberg, Die Cact. 5:2806 (1961); Glass & Foster, Cact. Succ. J. (US) 49(5): 246-7 (1977); E. F. Anderson, Bradleya 5:57, 64-6 (1987); Alsemgeest, Bregman & van Veldhuisen, Succulenta 74(4): 172-175 (1995)

This is a species noted for its wonderfully long central spines, developing after plants get to about four years old, and increasing in length and strength as they reach maturity.

It comes from the border area of San Luis Potosí, Nuevo León and Tamaulipas, with the variety *T. tulensis* var. *buekii* coming from a little further north in northern San Luis Potosí and Nuevo León, and the more recently described and more localized variety *T. tulensis* var. *matudae* yet a fraction further north in Nuevo León.



var.
tulensis

The type, *T. tulensis* var. *tulensis*, is described as solitary or frequently clustering, 10 to 25cm tall, 6 to 8cm wide, globose to elongate-globose, deep green to paler green, bronzing in full light, with 8 to 13 distinct vertical ribs and prominent round or a little pyramidal tubercles. Areoles have a partially developed groove, but no extrafloral nectaries. Central spines 1 to 4, with one (occasionally more) becoming dominant and very long, 30 to 40 (up to 80)mm, brownish-red to whitish, straight to twisted, flattened and ridged, the main one pointing upward, the others spreading. Radial spines 5 to 12, 7 to 15mm long, radiating, straight, needle-like. Flowers are variable in colour from white to yellow with barely a hint of a rose-pink midstripe to the petals, to reddish or pink with reddish midstripe and white to yellowish margins, 3.5 to over 4cm wide, 2.5 to nearly 3.5cm long; filaments are white, anthers yellow, style pink, stigma lobes 6 to 8, white or yellow.



T. tulensis var. *tulensis*,
in habitat, north-east
of San Luis Potosí, near
Palomas, San Luis
Potosí, Mexico

Tamaulipas and Nuevo León, specifically from 22°15' to 23°55' N and from 99°30' to 100°55' W, at 1100 to 1400m altitude.

Glass and Foster report the yellow-flowered form from near Huizache in San Luis Potosí. This form has generally larger tubercles, deeper green body colouring and red-brown spination. The Dutch Study Group are of the opinion in view of its different appearance and particularly its differing testa structure, that it is possibly more closely related to *T. conothelos*, and may be transitional between the two species, or indeed may warrant recognition as a separate species. Further study is clearly needed.



T. tulensis var. *tulensis*
(yellow flowered
form), in cultivation,
plant grown from
collected seed



var.
bueckii

var. **bueckii** (Klein) E. F. Anderson, Bradleya 5:57, 66 (1987); Klein, Gartenflora 8: 257 (1859) – as *Echinocactus buckii*, the illustration captioned *E. bueckii*; Britton & Rose, The Cact. 4:8 (1923) – as *T. bueckii*; Backeberg, Die Cact. 5:2805, fig. 2636 (1961) – as *T. bueckii*; Glass & Foster, Cact. Succ. J. (US) 49(5): 216-7 (1977) – as *T. bueckii*; E. F. Anderson, Bradleya 5:57, 65-6 (1987) – as *T. tulensis* var. *bueckii*; H. Bravo & H. Sanchez-Mejorada, Cact. Mex. 2: 171 (1991) – as *T. bueckii*

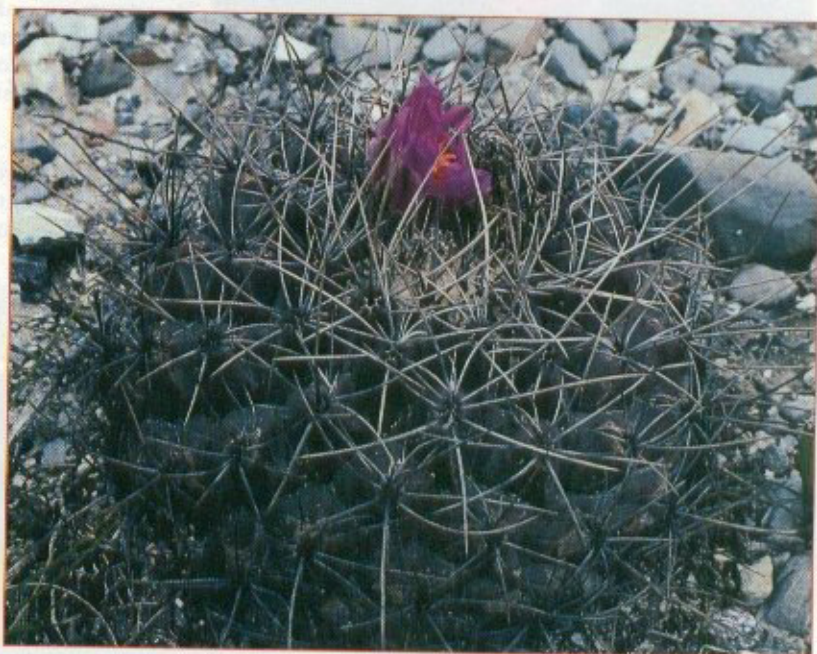
Anderson offers what appear to be sound reasons for opting for the spelling 'bueckii' for this variety, the original error believed by him to be in the heading of the description rather than the caption, and the taxon probably named for either Heinrich Wilhelm Buek or Johannes Nicolas Buek, both of whom were contemporaries of Klein, rather than for Dr Johannes Nicolaus Bück opted for by Rümpler and Föster in 1886 and by Britton and Rose in 1923, and followed subsequently by Backeberg. But who really knows?

Apart from its discrete locality, not too far from *T. tulensis* var. *tulensis* mind, this variety differs in some features from the type. It is described as being usually solitary, globose to subglobose, yellowish-green often becoming purplish-green or even brown, with ribs poorly developed if

discernible at all, the tubercles more or less pointed, angled and tending to elongate towards the top of the plant. Central spines 1 to 4, often very long, orange-brown to reddish or grey, straight to slightly curved, erect, needle-like. Radial spines much shorter, 1 to 4 or 5 (rarely to 8), 6 to 18 (to 25)mm long, spreading or radiating. Flowers are dark purplish-red to magenta, 3.5 to 4.5cm wide, 3.5 to 4cm long; filaments are white, style yellowish to pale lavender to white, stigma lobes about 7, yellow.

Reported from Nuevo León, specifically from 23°55' to 24°15' N, and from 99°50' to 100°50' W, at 1200 to 1800m altitude.

The Dutch Study Group suggest that because of the testa structure this variety and the following variety may be closer to *T. conothelos*.



T. tulensis var. *buekii*,
in habitat, at Km. 90,
on highway 57, near
Dr. Arroyo, Nuevo
León, Mexico

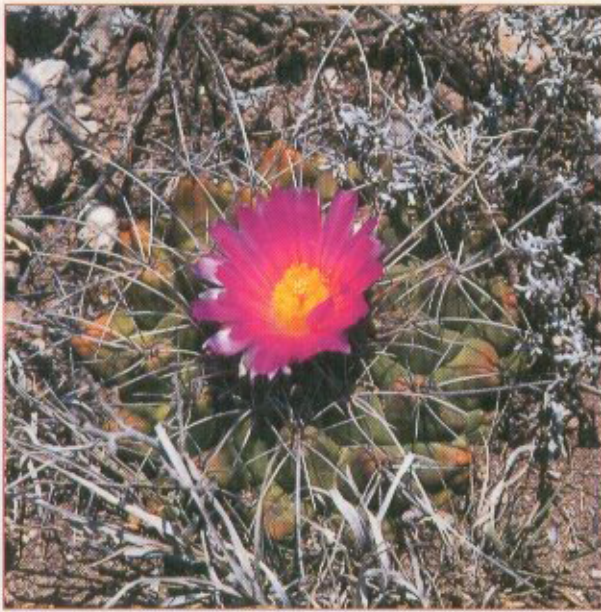


var.
matudae

var. **matudae** (Sánchez-Mejorada & A. Lau) E. F. Anderson, *Bradleya* 5:57,66 (1987); Sánchez-Mejorada & A. Lau, *Cact. Suc. Mex.* 23(3):51-2 (1978) – as *T. matudae*; E. F. Anderson, S. A. Montes & N. P. Taylor, *Threatened Cacti of Mexico* 96 (1994)

This is one of the most recently described in the genus, and is already considered "vulnerable" in the last mentioned publication above, because of its restricted distribution and its specialized habitat of gypsum soils and quite steep slopes.

It is described as solitary, globose, 8 to 14cm tall, 10 to 15cm wide, greenish-yellow with often purplish tips, the ribs indistinct, but the tubercles variable, usually conical but a little angular, sometimes becoming rib-like. Central spines 3 to 4, sometimes up to 7, 25 to 45 (occasionally to 78)mm long, reddish-brown to greyish, erect, straight. Radials spines 7 to 12, 14 to 25mm long, radiating, but somewhat ascending. Flowers are purplish-pink with darker midstripe, 7.5 to 8cm wide, 5cm long; filaments pale yellow to purplish-pink, style pale purplish-pink, stigma lobes yellow.



Reported from the Valley of Rayones, Nuevo León, at 25° N and 100°5' W, at 800 to 1000m altitude, and from the area where *Geohintonia mexicana* and *Aztekium hintonii* grow in eastern Nuevo León, some 50km away, so it is more widely distributed than first thought, but still considered to be vulnerable to predation from collectors, as the two new discoveries just mentioned have proved to be already. It may not have the numbers that they have to withstand too much habitat stripping, and from land development, always a threat in this developing country from the increasing apparent need for new roads, and we all know how irresistible that is!

As indicated for the previous variety the Dutch Study Group are of the opinion that because of the testa structure both these varieties may be more closely related to *T. conothelos*.

T. tulensis var. *matudae*, in habitat, a few km north of Galeana, on road to Rayones, Nuevo Leon, Mexico
T. tulensis var. *matudae* (Lau 744), in cultivation, plant grown from commercial seed



REFERRED & OTHER SUPERFLUOUS NAMES

T. bueckii

T. bueckii (Klein) Britton & Rose, The Cact. 4:8 (1923); Klein, Gartenflora 8:257 (1859) – as *Echinocactus buckii*, the illustration captioned *E. bueckii*; Backeberg, Die Cact. 5: 2805 (1961) – as *T. bueckii*; Glass & Foster, Cact. Succ. J. (US) 49(5): 216-7 (1977) – as *T. bueckii*; E. F. Anderson, Bradleya 5: 57, 65-66 (1987) – as *T. tulensis* var. *buECKii*; H. Bravo & H. Sánchez-Mejorada, Cact. Mex. 2: 171 (1991) – as *T. bueckii*

See under *T. tulensis* var. *buECKii*.

T. ehrenbergii

T. ehrenbergii (Pfeiffer) F. Knuth, Backeberg & Knuth Kaktus-ABC 359 (1935); Pfeiffer, Allg. Gartenz. 6:275 (1838) – as *Echinocactus ehrenbergii*; E. F. Anderson, Bradleya 5:62 (1987); Alsemgeest, Bregman & van Veldhuisen, Succulenta 74(2): 76 (1995)

Anderson says that no illustration appeared with the original description, nor was there a locality cited, but Pfeiffer stated in the foreword that the plants had been sent by Ehrenberg from Mineral del Monte, which is a town in Hidalgo, where *T. leucacanthus* occurs. He also states that these plants stand next to *T. porrectus*, later a variety of *T. leucacanthus*, and now regarded by Anderson as synonymous with *T. leucacanthus* too. On this evidence Anderson refers *T. ehrenbergii* to synonymy with *T. leucacanthus*. Backeberg in *Die Cactaceae* has a photograph of a plant in habitat at Ixmiquilpan in Hidalgo, which he offers as *T. ehrenbergii*; it has short spines and striking pink flowers. It closely resembles *T. leucacanthus* in appearance.

T. flavidispinus

T. flavidispinus (Backeberg) Backeberg, Cact. Succ. J. (US) 23(5):150 (1951); Beitr. z. Sukkde. u. -pflege, 6 (1941) – as *T. bicolor* var. *flavidispinus*; Die Cact. 5:2812 (1961)

See under *T. bicolor* var. *flavidispinus*.

T. fossulatus

T. fossulatus (Scheidweiler) Britton & Rose, The Cact. 4:10 (1923); Scheidweiler, Allg. Gartenz. 9:49 (1841) – as *Echinocactus fossulatus*; Backeberg, Die Cact. 5:2890 (1961) – as *T. hexaedrophorus* var. *fossulatus*; E. F. Anderson, Bradleya 5:69 (1987)

See under *T. hexaedrophorus*.

T. krainzianus

T. krainzianus Oehme, Beitr. z. Sukkde. u. -pflege, 1 (1940); Backeberg, Die Cact. 5:2808, fig. 2639 (1961)

This species is something of a mystery, as the original description cites only that the plant came from Mexico, and no type specimen is known. Oehme stated that it differed from *T. tulensis* (the name under which it was imported), in having longer spines, larger flowers and a different tubercle shape. With the known variability of *T. tulensis* such differences have little significance. Anderson says that it is distinctly possible that it could be the same as *T. tulensis* var. *matudae*, but there is too little real information to go on. It seems to have fallen by the wayside in both collections and in commerce, and that is perhaps the right place for it.

T. lloydii

T. lloydii Britton & Rose, The Cact. 4: 11 (1923); Backeberg, Die Cact. 5:2808 (1961)

Referred to varietal status beneath *T. hexaedrophorus* — see under that species.

T. longispinus

T. longispinus nom.nud.

According to the Dutch Study Group plants with this name are referable to the Huizache form of *T. tulensis*.

T. lophothele

T. lophothele (Salm-Dyck) Britton & Rose, Bull. Torr. Bot. Club 49:251 (1922); Salm-Dyck, Allg. Gartenz. 18:395 (1850) — as *Echinocactus lophothele*; Br. & R., The Cact. 4:7 (1923); Backeberg, Die Cact. 5:2803 (1961); Glass & Foster, Cact. Succ. J. (US) 49(5): 213-4 (1977); E. F. Anderson, Bradleya 5: 72 (1987)

Although this name is commonly seen in collections, it is invariably applied to plants referable to *T. rinconensis*, from Coahuila and Nuevo León.

The original description of a plant purported to have been collected in Chihuahua in 1850 by Potts, not illustrated adequately for another 50 years, does not, in the opinion of Glass and Foster followed by Anderson, allow for certain identification or allocation even to this genus.

T. nidulans

T. nidulans (Quehl) Britton & Rose, The Cact. 4:9 (1923); Quehl, Monatsschr. Kakteenk. 21:119 (1911) — as *Echinocactus nidulans*; Backeberg, Die Cact. 5: 2806 (1961); Glass & Foster, Cact. Succ. J. (US) 49(6): 245 (1977) — as *T. rinconensis* var. *nidulans*; E. F. Anderson, Bradleya 5:57-8, 72 (1987)

Anderson dismisses this long-spined form and other spine variations of *T. rinconensis* as impossible to distinguish from the type in view of the presence of the complete range of spine characters throughout the range of the species, thus there are no distinct populations of one or another to justify the retention of separate varieties let alone species — see under *T. rinconensis*.

T. phymatathele

T. phymatathele (Poselger) Britton & Rose, The Cact. 4:8 (1923); Poselger in Förster, Handb. Cact. ed.2: 602 (1885); Backeberg, Die Cact. 5:2803 (1961); Glass & Foster, Cact. Succ. J. (US) 49(6):246 (1977) — as *T. rinconensis* var. *phymatathele*; E. F. Anderson, Bradleya 5: 72 (1987)

For the reasons outlined under *T. nidulans* immediately preceding, Anderson does not uphold this name at any level — see under *T. rinconensis*.

T. pottsii

T. pottsii (Salm-Dyck) Britton & Rose, The Cact. 4:12 (1923); Salm-Dyck, Allg. Gartenz. 18:395 (1850) — as *Echinocactus pottsii*; Cact. Hort. Dyck 1849:173 (1850) — as *Echinocactus bicolor pottsii*; E. F. Anderson, Bradleya 5:61, 68-9 (1987)

There has been some confusion over the application of Salm-Dyck's *Echinocactus pottsii*, with some of the later candidates referring it to *Ferocactus*, but Anderson believes that Salm-Dyck's plant was a

Thelocactus, and refers it to synonymy with *T. bicolor* — see under that species.

T. sanchez-mejoradai

T. sanchezmejoradai Meyrán, *Cact. Suc. Mex.* 3(4):77 (1958); E. F. Anderson, *Bradleya* 5: 62 (1987)

Referred to *T. leucacanthus* — see under that species.

T. saussieri

T. saussieri (Weber) Berger, *Kakteen* 257 (1929); Weber in Bois, *Dict. Hort.*, 468 (1896) — as *Echinocactus saussieri*; Britton & Rose, *The Cact.* 4:13 (1923) — as *Echinocactus saussieri*, a “published species, possibly of this [*Thelocactus*] relationship”; Backeberg, *Cact. Succ. J. (US)* 23: 5, 151 (1951) *nom.nud.* — as *Gymnocactus saussieri*; *Die Cact.* 5: 2860 (1961) — as *Gymnocactus saussieri*; Glass & Foster, *Cact. Succ. J. (US)* 44(2):47 (1972); 49: 218 (1977); E. F. Anderson, *Bradleya* 5: 66 (1987)

This species was reported originally from Matehuala in San Luis Potosí state, but no illustration accompanied the description, which was as follows: depressed-globose, 15 to 20cm in diameter; ribs spiralled, strongly tubercled; radial spines 9, greyish-white, 15mm long; central spines 4, acicular, 3 to 4cm long; flowers purplish, 4cm in diameter; inner perianth-segments lanceolate; stamens and style yellow.

Anderson quotes others' observations in the field on the relationships of *T. saussieri* (which is still commonly seen offered commercially) and *T. conothelos*, viz. Kladiwa and Fittkau, 1971; Glass and Foster, 1972; Baborak, 1978, which support his own field observations, leading him to conclude that “there is but a single highly variable species”: *T. conothelos* has priority, see under *T. conothelos*.

T. schwarzii

T. schwarzii Backeberg, *The Cact. Succ. J. Gr. Brit.* 12(4):81 (1950); *Die Cact.* 5:2813 (1961)

Referred to *T. bicolor* var. *schwarzii*.

FIELD COLLECTORS' NUMBERS

These are numbers allocated by collectors of plants in the wild, some of which will subsequently have been distributed by vegetative propagation. The plant names, localities and descriptions listed below are repeated from the field notes recorded by each of the field collectors.

The original plant(s) and these vegetative propagations are the only plants which validly bear these numbers. Propagations by seed from these plants should at most be allocated these numbers with a qualification, e.g. "Lau 630 (seed-grown)". And even further away from the original plants are those grown from commercial seed sold with such numbers, which is likely seldom to have been produced from original material. The label on such plants should bear the number (if at all) with even more of a qualification — "Lau 630 (commercial seed)". But perhaps I am overstating the case.

Lau
(Alfred Lau)

630	hexaedrophorus var. fossulatus	Villar, San Luis Potosí, 1700m
636	heterochromus	Santiago Papasquiaro, Durango, 2200m
663	conothelos var. argenteus	Road from Ascensión, near Sandia, Nuevo León, 2200m
664	tulensis var. bueckii	Road from Ascensión, near Sandia, Nuevo León, 2200m
684	bicolor var. schwarzii	Zaragoza, Tamaulipas, 50-100m
708	bicolor var. tricolor	Ceballos, Durango, 1600m
713	leucacanthus (ehrenbergii)	Vista Hermosa, Querétaro, 1300-1800m
724	hexaedrophorus	Las Tablas, San Luis Potosí, 1400m
731	conothelos	Road from Cardenas, near La Jolla, SLP, 1600-1800m
733	hexaedrophorus var. fossulatus	Guadalcazar, San Luis Potosí, 1500m
734	conothelos var. argenteus (saussieri)	Matehuala, San Luis Potosí, 1600-1700m
744	tulensis var. matudae	Rayones, Nuevo León, 800m
752	sp.	18 de Marzo, Nuevo León, 2700m
789	hexaedrophorus var. lloydii	Fresnillo, Zacatecas, 2400m
794	bicolor	Nazas, Durango, 1800m
794a	bicolor	Ascensión, Nuevo León, 2400m
796	bicolor (wagnerianus)	Bahio de Ahuichiola, Coahuila, 1600m
1000	bicolor var. bolansis	Viesca, Coahuila, 1000-1300m
1006	rinconensis	Rinconada, Nuevo León, 1300m
1007	conothelos var. argenteus (saussieri, yellow flowered)	Aramberri, Nuevo León, 1200m
1068	conothelos var. aurantiacus	Aramberri, Nuevo León, 900-1300m
1100	tulensis	Tula, Tamaulipas, 1600m
1172	hexaedrophorus	Mina de San Rafael, San Luis Potosí, 1300m
1311	tulensis	La Hincada, San Luis Potosí, 1600m
1327	rinconensis var. nidulans	Ramos Arispe, Coahuila, 1300-1600m
1456	bicolor var. bolansis	Sierra Bola, Coahuila, 1200m
1457	tulensis var. bueckii	Doctor Arroyo, Nuevo León, 1700m
1458	leucacanthus	Vizarron, Querétaro, 1200m
1459	rinconensis var. nidulans	Ramos Arispe, Coahuila, 1300m
1460	tulensis	La Hincada, San Luis Potosí, 1600m

Gl. & F.
(Glass Foster)

Note: Km27 indicates a road marker post, while 27km indicates merely a distance.

571	bicolor var. flavidispinus	3.5m south of Marathon, Texas
581	bicolor	1m south of Zapata, Texas
606	rinconensis (Iophothele)	South of Monterrey, Huasteca Canyon, Nuevo León
607	rinconensis	South of Monterrey, Huasteca Canyon, Nuevo León
608	macdowellii	Km377, on highway 40, south-east of road, Nuevo León
613	rinconensis (var. phymatothelos)	South-east of Saltillo, Km852 on highway 57 towards Matehuala, Nuevo León
619	tulensis var. buekii	Km732 east of highway 57, Nuevo León
634	tulensis var. buekii	East of highway 57, Nuevo León
638	tulensis var. buekii	North of Diez y Ocho de Marzo town, north of Galeana, Nuevo León
654	tulensis var. tulensis	Half a mile south of Presa de Guadalupe off Huizache road between Huizache and Tula, Tamaulipas
682	conothelos var. conothelos	6m south-west of Jaumave, on hill north-west of road, Tamaulipas
697	bicolor	North of Matehuala, San Luis Potosí
795	heterochromus	Km1151 on highway 45, Durango, on flat hilltops
800	heterochromus	Rio Nazas Valley, Durango
859	hexaerophorus (fossulatus)	Highway 49, north side of road, in Zacatecas, just before San Luis Potosí
882	hexaerophorus (fossulatus)	San Luis Potosí, hills above Garcia, north of town, on limestone
892	hexaerophorus (fossulatus)	On hill just north-east of junction of highway 57 and Guadalcázar road, just north of Charco Blanco
895	conothelos (saussieri)	20m east of Matehuala, on Dr.Arroyo road, about 8m into Nuevo León, on hill north of road (in thousands!)
896	hexaerophorus (fossulatus)	Locality as for 895 (also there in thousands!)
903	conothelos (saussieri)	Back on the Dr. Arroyo road, on hills just east of Matehuala, a few miles further, in same group of hills, 1 to 2 miles west of Nuevo León border, at Km20
909	conothelos (saussieri)	Las Jarillas, at the pass, hills with <i>Dasylium longissima</i> and tens of thousands of this species and <i>T. hexaerophorus</i> (fossulatus); hills just before Dr. Arroyo
925	tulensis var. tulensis (longispinus)	First hill just east of Huizache Junction, on Mante road, 1m east of highway 57, same as plants from further east
932	tulensis var. tulensis (longispinus)	About half a mile south of Huizache Junction (Km532) around base of low hill just east of highway
1618	bicolor var. flavidispinus	Few miles south of Marathon, Brewster Co., Texas
1689	rinconensis (var. nidulans)	Sierra de la Paila, between Parras and Saltillo, Coahuila
1708	rinconensis (Iophothele)	Between Saltillo and Monterrey, north of Ramos Arispe, highway 40, Km27 at mountain base south-east of highway, Coahuila

1717	conothelos	Near Puerto El Oregano, Km28, highway 57, border San Luis Potosí, on road to microondas, Cruz de Elorza
1737	hexaedrophorus	Km32 highway 57, San Luis Potosí
1963	hexaedrophorus (var. lloydii?)	Road north of Zacatecas to Saltillo, Km12.5 north-west of highway, last hill on left, Zacatecas
1967	hexaedrophorus (var. lloydii?)	As for 1963
2136	heterochromus	Highway 45 by San Juan Rio, Durango
2139	heterochromus	Highway 45, 1m north of Rio Nazas, 3m on road to Minas Navidad, Durango
2215	rinconensis (var. nidulans)	10m from Estacion Marte on sideroads, Nuevo León/Coahuila
2218	macdowellii	Huasteca Canyon, north of Monterrey, Coahuila
2238	rinconensis	Near San Felipe, Nuevo León
2246	rinconensis (var. phymatothelos)	Ca. 20km south-east of Saltillo, highway 57 near Km236, Coahuila/Nuevo León
2257	tulensis var. bueckii	South of San Jose de Raices, Nuevo León
2269	conothelos	10m east of Matehuala, Nuevo León
2275	hexaedrophorus	20m east of Matehuala, Nuevo León
2276	conothelos	As for 2275
2283	bicolor	Around 21m north of Huizache junction, San Luis Potosí
2311	tulensis	15m east of Huizache junction, San Luis Potosí, on slopes north of road
2322	hexaedrophorus (fossulatus)	Km30, highway 57, San Luis Potosí
2330	hexaedrophorus (fossulatus)	7m south of Km30, highway 57, San Luis Potosí
2639	hexaedrophorus var. lloydii	Fresnillo, 1.5m beyond town to microondas tower at Km66
2934	tulensis var. bueckii	Just south of San José de los Raices, Nuevo León
2938	hexaedrophorus (fossulatus)	Attractive, slate-grey form, a few miles south of La Bonita, about 21m south of Mrs. Jones's
2939	conothelos (saussieri)	As for 2938, but only halfway up hill
2971	conothelos (saussieri) white flowered	Heading east towards Dr. Arroyo, about 12m east of junction at Matehuala
2973	conothelos	North of Matehuala to Dr. Arroyo highway, a side road leaving a few kilometres west of Dr. Arroyo
2984	tulensis var. bueckii	Continuing north from Dr. Arroyo, past Puerto Carretas, at about Km88
3007	rinconensis (var. nidulans)	Sierra de la Paila (in cultivation in Parras de la Fuente, Coahuila)
3008	rinconensis	In cultivation in Parras de la Fuente, Coahuila
3022	rinconensis (var. nidulans)	First real hills north of Marte, Sierra de la Paila, Coahuila
3059	rinconensis (var. nidulans) (with purple flowers)	Rejoining Saltillo to Piedras Negras just south-west of La Muralla, going south towards Saltillo for 15.5m, and turning right to gain access to mountains to the west, on road fading to a trail, in hills
3090	rinconensis (lophothele)	Near Ramos Arizpe, near chicken ranch, about 20km north-east of Saltillo, on road to Monterrey, on right side of road - the most south-western tail of mountains
3102	rinconensis (var. nidulans)	El Chiflón, out of tiny town upstream along path by the water, on lefthand canyon walls and on top of the mesa

3131	rinconensis	With generally 3 spines (close to var. phymatothelos), Saltillo, waterworks north of town and north-east along dirt road to quarries at base of hills. From first hill on left, past a few smaller hills on the right, over the quarry and halfway up the hill, among grey limestone rocks
3139	rinconensis (var. phymatothelos)	South through Arteaga Canyon towards Matehuala, within the canyon
3155	hexaedrophorus (fossulatus)	Highway 57, near border of Nuevo León and San Luis Potosí, 34m further south at the start of the hills before the Matehuala valley, by quarry on west side of road
3156	conothelos (saussieri)	As for 3155
3164	conothelos east	First hills, the north flank of La Peña south of road, of Matehuala by about 12m
3167	hexaedrophorus (fossulatus)	About 20m from junction at Matehuala to Dr. Arroyo
3176	conothelos var. argenteus	Going from Ascensión towards Sandia, after the pass there are some lower hills: on top of hills north of road, growing on low limestone ridges, among grass
3177	tulensis var. bueckii	As for 3176
3183	conothelos var. aurantiacus	Rocky ridges just outside Aramberri
3201	tulensis (yellowish flowers)	About 12 miles east of Aramberri
3208	tulensis	Top of pass near Las Tablas
3220	tulensis	On hilltop almost within city of Tula, Tamaulipas
3225	conothelos	About 17m north of the northern Tula junction at the start of the climb into the mountains, in hills and mountains west of highway 101, in limey soil
3255	conothelos	Quarry just opposite town of Los Ebanos.
3319	rinconensis (var. nidulans)	With golden to reddish, shreddy spines, west of Saltillo, Coahuila
3544	conothelos	Highway 57 south of Matehuala, San Luis Potosí, south to microondas tower just south of La Bonita, on hillside
3552	hexaedrophorus (fossulatus)	Forma "La Bonita", with small, white flowers and steely grey epidermis; locality as 3544, but lower on slopes
3586	hexaedrophorus (fossulatus)	Towards Los Cerritos on paved road just south of the Guadalcázar road, about 6m in (Km9.5) well into hills
3596	tulensis (with yellowish flowers)	Foot of mountains south of Huizache just east of highway
3599	conothelos var. aurantiacus	As for 3183
3605	conothelos var. aurantiacus	Near La Escondida, at Km84 near the junction to Aramberri
3730	rinconensis (var. nidulans)	North-west of Monterrey, to the west just north of Minas, 2m from San Felipe towards Arista, at a low hill and 4m further at a low, limestone ridge to right of road
3737	rinconensis	10m south of Icamole on old, dismantled railroad trestle, at a limestone mountain on the left, nearly a mile towards the mountain in grey limestone rock
3749	rinconensis	Microondas Mariposas, a few km from Casa Blanca, the junction to La Rinconada; at the top, on rocks
3909	conothelos var. argenteus	As for 3176
3916	tulensis var. bueckii	On hills on road from La Escondida to Aramberri

3918	<i>tulensis</i> var. <i>bueckii</i>	As for 3176
4031	<i>hexaedrophorus</i> (var. <i>lloydii</i> ?)	Highway 49 at Km84+ in Zacatecas, on over-grazed flats
4035	<i>hexaedrophorus</i> (var. <i>lloydii</i> ?)	Out of Nieves, about 23 miles from highway 49, on south side of road
4074	<i>hexaedrophorus</i>	Road is paved for almost 6m south of Los Cerritos to Villa Juárez; about 6m further south at canyon on right of road; near the base of the slope
4105	<i>tulensis</i>	In hills at Km30 about 19 to 20m south of Dr. Arroyo, the first hills seen
4114	<i>tulensis</i> var. <i>bueckii</i>	On a low hill across grassy, chalky flats, 2m south of the side road to Salero and Sandia, off highway 57
4283	<i>leucacanthus</i>	Tasquillo canyon, Tula river at 1630m altitude, Hidalgo
5023	<i>bicolor</i>	Side road to Cerritos, half a mile east of highway 57
5164	<i>tulensis</i> var. <i>matudae</i>	Municipio Galeana, at type locality of <i>Geohintonia mexicana</i> , Nuevo León
5183	<i>tulensis</i> var. <i>bueckii</i>	North of Aramberri, Nuevo León
5195F	<i>tulensis</i> (biggest ever seen)	Just south of Huizache Junction, San Luis Potosí
5469	<i>hastifer</i>	Querétaro, on road to Pueblo Nuevo, Mesa de León and Presa de Zimapán
5523	<i>tulensis</i> var. <i>bueckii</i>	Km90, north of Dr. Arroyo, Nuevo León
5529	<i>conothelos</i> var. <i>argenteus</i>	Cerro Hijo near Ascensión, Nuevo León
5571A	<i>hexaedrophorus</i>	Km24 between Matchuala and Dr. Arroyo, Nuevo León
5577	<i>tulensis</i>	South of Mier y Noriega
5648	<i>tulensis</i> var. <i>matudae</i>	As for 5164
5652	<i>tulensis</i> var. <i>bueckii</i>	Km90 north of Dr. Arroyo, Nuevo León
5659	<i>tulensis</i>	South of of Huizache Junction, San Luis Potosí, on east of highway 57
6088	<i>hexaedrophorus</i>	Km30, highway 57, north of San Luis Potosí
6144	<i>bicolor</i> var. <i>schwarzii</i> (in quantity)	Highway 57, González, Tamaulipas
6413F	<i>bicolor</i>	Hipólito Junction, west of Saltillo, Coahuila
6419	<i>bicolor</i> var.	Sierra de la Paila, Coahuila
6430	<i>bicolor</i>	Cañon Verde, Coahuila
6447	<i>rinconensis</i> var. <i>rinconensis</i>	El Chiflón, west of Saltillo, Coahuila
6449	<i>bicolor</i>	As for 6447
6455	<i>bicolor</i>	San Ignacio de Texas, Nuevo León
6599	<i>bicolor</i>	6km east of of junction on road to Catorce, San Luis Potosí
6606	<i>tulensis</i> var. <i>matudae</i>	Few km north of Galeana, Nuevo León, road to Rayones
6613	<i>tulensis</i> var. <i>matudae</i>	A few km before type locality of <i>Geohintonia mexicana</i> , in Municipio Galeana, Nuevo León
6657A	<i>conothelos</i> var. <i>aurantiacus</i>	Few km south of Escondido, highway to Dr. Arroyo
6661	<i>bicolor</i>	Km78 north of Dr. Arroyo, Nuevo León
6723F	cf. <i>tulensis</i> var. <i>bueckii</i>	(With diameter of 25cm and more) road from Rayones to San Rafael, Nuevo León
6736F	<i>hexaedrophorus</i>	Km75 north of San Luis Potosí, highway 57

7215	hexaedrophorus var. lloydii	Km12.5 highway 54, to Concepción del Oro and Saltillo, Zacatecas
7385A	tulensis var. bueckii	Km94.5 north of Dr. Arroyo, Nuevo León
7401	conothelos var. aurantiacus	Aramberri, Nuevo León
7421	cf. tulensis var. matudae	Km43, Galeana to Linares, Nuevo León
7453	tulensis var. matudae	Sierra del Aguila near Rayones, Nuevo León
7564	hexaedrophorus	Near Cañas, San Luis Potosí, north of highway from San Luis Potosí to Rio Verde
7642	bicolor (depressed reddish form)	Between Parras de la Fuente and General Cepeda, Coahuila
7926	conothelos var. argenteus	(In quantity) slopes near Sandia, but not type locality
7927	tulensis var. bueckii	As for 7926
7949	hexaedrophorus var. lloydii	Zacatecas, about 6m beyond San Lucas on road from Nieves (Francisco Murquía) to Concepción del Oro
7953	cf. hexaedrophorus var. lloydii (very long spines)	Between Laguna and Villa Cárdenas, Zacatecas
7957	cf. hexaedrophorus var. lloydii	(With exceptionally long spines) north of Juan Aldama, about 4.5km out of town
7967	cf. bicolor (var. nov.?)	(With very heavy 'heterochromish' spines) Durango, north of Juan Aldama
7980	heterochromus	Near Nazas, Durango
7982	heterochromus	Near Río Nazas, Durango
8144	leucacanthus	Presa de Zimapán, Querétaro/Hidalgo border
8175	conothelos var. aurantiacus	Aramberri, Nuevo León
8177	conothelos var. aurantiacus	Between Aramberri and La Escondida, Nuevo León
8196	conothelos	(Typical form, but with yellow flowers) from Aramberri towards Zaragosa, Nuevo León
8208	cf. tulensis var. bueckii	(Almost spineless) Km90 north of Dr. Arroyo, Nuevo León
8215	conothelos var. argenteus	Km14.5 on road from La Ascensión to Sandia
8229S	tulensis var. matudae	Road to Geohintonia mexicana habitat, Municipio Galeana, Nuevo León
8247	tulensis var. tulensis	Tula, Tamaulipas
8249	hexaedrophorus (greenish stems, pink flowers)	Near Villa Juárez, San Luis Potosí
8288	bicolor	Near San Ignacio de Texas, Nuevo León
8293	conothelos var. argenteus	Further south of San Ignacio de Texas, Nuevo León
8567	tulensis	Mountain at Km9.5, highway south of Tula, Tamaulipas
8582	tulensis	South side of same mountain (see 8567)
8738	conothelos	Km69.5 north of Tula, highway to Jaumave, Tamaulipas
8851	tulensis var. tulensis	1km south of junction to Las Tablas, San Luis Potosí, from Ciudad Maiz highway

77	bicolor (var. pottsii)	West of Jimenez, Chihuahua
113	hexaedrophorus (var. lloydii?)	Salinas, San Luis Potosí
278	bicolor	Huizache, San Luis Potosí
281	bicolor (var. bolaensis)	Cerro Bola, Coahuila
287	bicolor	Saltillo, Coahuila
291	hexaedrophorus	La Perdita, Dr. Arroyo, Nuevo León
301	rinconensis	Rinconada, Nuevo León
302	conothelos	Matehula, Nuevo León
311	conothelos var. argenteus	Ascensión, Nuevo León
329	conothelos var. aurantiacus	Aramberri, Nuevo León
339	tulensis var. matudae	Rayones, Nuevo León
424	bicolor var. flavidispinus	Brewster Co., Texas
514	leucacanthus	Ixmiquilpan, Hidalgo
563	bicolor	Cuesta la Muralla
564	heterochromus	Matamoros
567	bicolor (var. bolansis)	Brewster Co. Texas
579	leucacanthus (var. schmollii)	Vizarron, Querétaro
607	bicolor (var. bolansis)	San Pedro, Coahuila
851	setispinus	Jim Hogg Co., Texas
858	setispinus	Cameron Co., Texas
866	bicolor	Starr Co., Texas
867	setispinus	Starr Co., Texas
892	hexaedrophorus (var. fossulatus)	Guaxcama
973	tulensis var. buekii	Galeana, Nuevo León
985	setispinus	Val Verde Co., Texas
1074	hexaedrophorus	Charco Blanco, San Luis Potosí
1172	tulensis (longispinus)	Coronel Junction, San Luis Potosí
1175	hexaedrophorus	San Gregorio, Nuevo León
1339	tulensis var. matudae	Rayones, Nuevo León
1715	bicolor (var. bolansis)	S. Boquillas, Coahuila
1811	setispinus	Kimble Co., Texas
1862	conothelos var. argenteus	Sandia Grande, Nuevo León
1878	hexaedrophorus var. lloydii	South-east of Gen. P. Natera, Zacatecas
1879	heterochromus	South of Satero, Chihuahua

To be sure, this is not

THE END

The Cactus File

The Magazine For Growers of Cacti and Other Succulent Plants



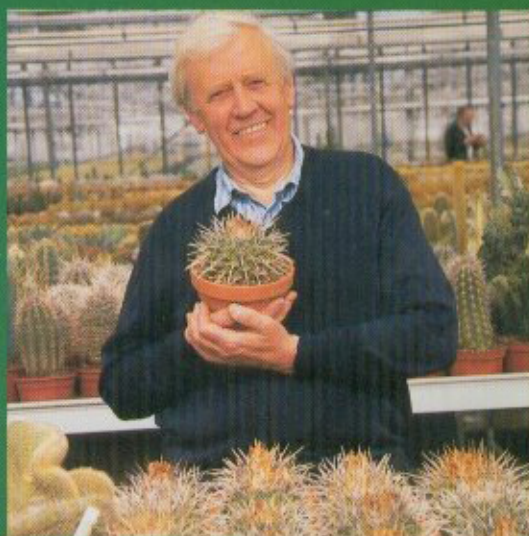
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